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The Beattie-Smith Lectures.[1]

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THE CONDITIONS OF CIVILIZED LIVING AND THE PROBLEMS OF MENTAL HEALTH.

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LECTURE I: THE SOCIAL PSYCHOLOGY OF MENTAL EPIDEMICS.

IN 1922 Dr. William Beattie-Smith left a bequest to the University of Melbourne to "establish a few annual lectures on the early treatment of insanity, as I consider the practitioner and the public are in need of much education in regard to this subject". Since then 15 distinguished pathologists, neurologists and psychiatrists have given these memorial lectures. This is the first time that a psychologist has been asked to speak.

I should like to say now that I am deeply conscious of the honour thus conferred on me by the medical faculty of this university. But I am also conscious that it is a recognition of the establishment of psychology as an independent discipline, with its own body of knowledge, methods of training and standards of professional knowledge.

But I am faced by an anomalous situation. In Victoria, psychologists as a whole know more about psychiatry than psychiatrists—with some notable exceptions—know about psychology. This itself is a measure of the distance psychology has travelled since 1922, and a measure of the "cultural lag" of the medical curriculum.

I decided, therefore, first to select those aspects of general social psychology which bear on the problems of social mental health. During the 1939-1945 war collaboration between psychologists and psychiatrists became common. The most fruitful developments for both theory and practice have come from experimentation (under the pressure of wartime needs) with social groups and the dynamics of social fields. I refer to such matters as leadership selection, civil resettlement, group therapy, and the analysis of the Nazi authoritarian character by a combination of individual and group-dynamic methods.

Within this still formidably large and complex field I have selected a specific problem: the mechanisms whereby mental epidemics such as prejudices and group aggressions are spread.

In these lectures, therefore, I propose to consider: (i) the social conditions in which instability or maladjustment of the personality arises, its connexion with mental epidemiology, and some methods by which psychology studies the conditions and endeavours to alleviate or to cure maladjustment; (ii) the implications of this analysis for the effective interrelations between psychologists, psychiatrists and general medical practitioners, and for the training of these and other specialists who deal with human beings.

The Development of Psychology.

Psychology did not begin as an attempt to understand persons. Such understanding was tacitly presumed to be intuitive, growing and deepening by experience, but not amenable to scientific analysis. Psychology began as the introspective study of the mind, as a branch of philosophy.

[1] Delivered at Melbourne on June 19 and 26, 1950.

During the nineteenth century attempts were made to expand it also as a branch of biology—physiology and evolution theory. But emotions and volitions were for long believed to be incapable of scientific appraisal.

The development of "mental measurements", however, began more and more to focus attention on individual differences. The influence of biology and physiology had the effect of drawing attention first to animal behaviour (since animals cannot communicate their thought processes other than through behaviour), then by extension to the behaviour of human beings. By "behaviour" is meant here the action of the person as a whole, in settings that approximate to, or are miniature copies of, settings to be found in everyday life. If a person responds to a light stimulus in the laboratory, he is "behaving". But the stimuli are artificial and behaviour is very restricted. That memory can distort perception is easily demonstrated. Consequently, it was argued, memory must be eliminated and "pure" stimuli used. A study of the responses to pure stimuli would enable us to build a theory of the nature and properties of perception, of memory, and so on for the other "faculties" of the mind.

To begin with, emotions were regarded as nuisances to be eliminated. However, the physiological studies of instinct and emotion in animals helped to give greater importance to the view of man as a biological organism, which responds as a whole organism to the demands of an external as well as of an internal environment. Moreover, the experimental psychology of perception also demonstrated that a local, or "atomic", response to an isolated stimulus was an artificial and relatively meaningless rarity and that, on the contrary, even the simplest act of perception involves exceedingly complex neurological and psychological relations. In other words, the organism as a whole responds, provided it is intact. If it is not, the function which has been affected is compensated for in such a way that the organism continues to act as a whole. Good examples of this are to be found in the studies by Lashley (1929, 1933) and others of the effects on learning of extirpating parts of the cerebral cortex, or in studies of brain injuries by Goldstein (1939), Halstead (1947) and many others.

It became evident, too, in what way perception is a selective process. The important—and long overlooked—principle was experimentally established that what is perceived and how it is perceived depend on the needs of the organism. The human organism has not only biological needs; provided the basic biological needs are satisfied, the human organism operates within a system of symbolic needs, which determine what is perceived and what responses will take place. This development leads directly into clinical psychology.

Psychologists began to pay attention to persons as clinical entities when mental measurement had been developed. You will recall that at the beginning of the twentieth century Alfred Binet began with the problem of distinguishing in the French primary schools those who could not learn from those who did not. You will also be aware of the far-reaching influence his psychometric method has had on educational and on clinical practice.

It became more and more evident that intelligence is not an organ that can be examined *in vitro*. It is a function, not only of the organism's biological equipment and optimal growth conditions, but also of its social relations. One frequently finds children whose intelligence as measured appears to be normal, but whose intellectual and cultural attainments lag far behind the normal. We know now that the causes for this lag are to be sought in the child's social relationships, especially in the family, and not in neglected ethical imperatives. Indeed, if a child's educational attainments are low because it is lazy, the laziness is itself a response to unfulfilled social needs, to distraction by needs more powerful than those on which the teacher bases his incentives to learning. It was this insight which, together with the revolutionary advance of psychoanalysis, stimulated the intensive development of experimental social psychology, and this development in turn has had profound effects on clinical practice and on the training of psychologists. Let us, then, consider some aspects of social psychology in so far as they are relevant to the problems of mental health.

The Social Psychology of Group Aggressions.

During the war it was a common experience for staff officers from General Headquarters to find themselves treated with increasing hostility as they went to headquarters increasingly near the front. The reasons given were that staff officers were "chairborne" and therefore useless to fighting men, or were responsible for muddling supplies and orders. Another common experience was hostility expressed (often in violent physical assault) by infantry to air force for lack of support, especially at times when the enemy had local command of the air, as in the early stages of the North African campaigns. What were the reasons for this?

When a man enlists, two things happen to him: first, his actual links with normal social life become more and more tenuous and finally break as he goes to the combat zones. Secondly, he has to become a member of a new community. Many studies have shown that after about a year of overseas service his reality-based memories of home begin to fade quite rapidly. Letters, however frequent, can never be a substitute for reality. The recipient is merely passive. He has no longer any real authority over his growing children, plays no role in the home or among his former social and work groups. The Fourteenth Army in Burma came to be called "the army of forgotten men". But this is true of all armies. They are both forgotten and forgetting.

Now the result of these lost relationships is a sense of deprivation, most clearly seen in the frequent depressive states. (See, for example, Newman, 1944, on the prisoner-of-war mentality.) Depression is a symptomatic result of a conflict initiated by mourning, and in all mourning there is regression to earlier and even to primitive states of feeling, accompanied by many compensatory and even hallucinatory fantasies. These fantasies, or transformed memory images, take the place of a real functional relationship; and they are factors which determine the person's social perceptions.

But overtly, deprivation and frustration also lead to aggression. We find, in fact, hostility expressed to representatives of social groups at home. So, in this instance, the staff officer was the scapegoat, on to whom were projected all these feelings of deprivation.

Such incidents give us some insight into the epidemiology of mental disease. Great numbers of men can become infected with "scapegoatitis". The more isolated the group, the stronger the disease and the more rapid the contagion. We all know from experience how hard it is to resist giving way to projective fantasies, and to recognize changes in social perception when all around are bringing forward one so-called example after another of "the criminal negligence of those at home in safe jobs".

Many examples of contagious mental disease will occur to you, from lynching and the panic that seizes leaderless mobs to the more subtle contagion of emotional propaganda and prejudice. But description will not suffice. If we are to use more than faith or magic in attempting a cure, we must understand the ætiology of a disease.

The first step must be to gain some idea of the structure of social space, so that we can set up criteria of desocialization, for it appears that these phenomena show themselves when people are "disconnected" from their society. It is an awkward term, but exceedingly important. The phenomenon of creating scapegoats is real, widespread, important in times of crisis, and a sign of mental maladjustment. Consider, in passing, how important to society it is at the present time to understand this phenomenon and to do something to reduce its incidence, and compare the scope of this need with that of curing maladjusted individuals by means of individual psychiatric or psychological treatment. Is the latter not like dealing with a typhoid epidemic through paying attention only to people suffering from acute forms of the disease? Before

we can consider criteria for desocialization, we must glance briefly at the process by which a person becomes and functions as an integral member of society.

We note, first, that the human being grows up from birth as a member of a social group, the family. I shall later show a few examples of tensions in families and how these affect children. In the family the child learns certain patterns of behaviour, what he may and may not do, how he must and must not conduct himself. He learns to regard some people as belonging to the in-group and some as belonging to various out-groups. Often—far too often—members of out-groups are given the emotionally toned appellation "outsiders". When he learns such linguistic devices as the word "outsider", his perceptions of the personalities of others is profoundly affected. He will be able to perceive their unpleasant attributes far more easily than their good ones. Love, as you know, is not blind. On the contrary, it acts on perception of the love object more like a microscope afflicted with some blind spots. This is a picturesque way of saying that perception of personalities, including one's own personality, which are part of social reality, is highly selective.

The Mechanism of Projection.

For this special audience I need not go into details of the processes and stages of emotional development. These can be read in any standard text-book of psychoanalysis such as that by Glover (1949) or Fenichel (1946). What we need to emphasize here is that in the course of development a number of universal mechanisms appears. Three have already been mentioned: aggression and regression, both of which are consequent upon frustration or deprivation, and projection. We must concern ourselves a little more closely with projection.

The prototype of this mechanism is to be found in infant anxiety states, most clearly perhaps in three to five year olds. It seems that over-excitation gives rise to automatic attempts at discharge in such a way that the internal pain or danger is treated as though it came from without rather than from within.

The basic notion of dynamic psychology is, of course, that the responses of an organism have as their primary purpose the reestablishment of equilibrium. A rat is active when it is in a state of hunger tension, and its activity ceases when food has been pereived and ingested.

Now frustration sets up a state of tension; and this frustration is frequently attributed to some external object. even when this object has no real part in producing it. Furthermore, hostility towards the object is transformed into hostility of the object: not "I hate my enemy", but "my enemy hates me". This is sometimes called "reversal of aim". Sadistic impulses are transformed into a masochistic relation with an object. An apt illustration of this may be found in a remark attributed to the King of Denmark during the Nazi occupation. When asked by the Nazi *Gauleiter*, "How do you deal with your Jewish problem?", the king is said to have remarked: "We do not have a Jewish problem. You see, we do not feel inferior to the Jews."

Hysterical phobias show exaggerated forms of this mechanism. In such exaggerated forms we can easily see the mechanism at work. We should also note that the patient is still object-related even when considerable regression has taken place, but the object appears far more menacing than it in reality is or can be.

Once we have seen obvious forms of projection, it is easy to recognize projection in normal people, who constantly use it to lessen the tensions of frustration—such as the golfer who smashes his clubs, or the business man who throws the telephone onto the floor. From these relatively harmless and sporadic projections, which clearly are not pathogenic, we can proceed by stages to more severe cases ending with the hysterical phobias. An important exciting cause of this projection of aggression is the frustration of the adult sex drive, which often causes sexual maladjustment leading to marital conflict, and, on a large scale, to such writings and actions as those of the Nazis about Jews and communists.

So far, the only part of a possible treatment that seems reasonably clear is that dirty printing should be prohibited, just as firmly as dirty milk.

We seem to have wandered far from the rejection by front-line troops of "visitors" from rear headquarters. My aim was to show that the projection which was encountered was not in itself bizarre or even unusual. The paranoid element, which becomes stronger the more the projections take on a psychotic character, was not particularly pronounced. Where people are in a state of social tension, there we shall invariably find projection at work. Now the phrase "social tension" is used deliberately: for the fact that the troops were in tension owing to physical danger had very little, if anything, to do with their attitudes and their projections. There is voluminous evidence that neurotic or psychotic breakdowns in stress situations occur only in those already predisposed by the course of their early development (excluding, of course, physiological causes of psychosis). As the child grows up he successively relates himself to members of his family, to other children, to his peer group at school, and finally to his work group and other adult associates. Throughout, he is subjected to some form of authority, especially by the father. The way in which that authority is internalized and later projected is a crucial factor, both in his personal dynamic stability (or mental health) and in his social relations.

Social Structure and Social Relations.

In speaking of "social relations" we have to bear in mind four components of society: social structure, social roles, social relationships, and culture (Curle and Trist, 1947).

By social structure we mean a more or less organized framework within which the social person moves and which ensures that the person's needs can be satisfied. There are many such frameworks, from government to the local bowling club. Within any such framework the individual is free to move, but is also constrained in various ways. Social space (which is a symbolic construct and not congruent with physical space) is thus divided into a number of regions separated by more or less permeable barriers. Social classes are a good example of regions with permeable barriers. Each class develops its own particular *mores* and taboos and behaviour patterns with regard to matters of food, clothing, speech, sex and so on. (See, for example, Kinsey *et alii*, 1948, on the different sexual habits and *mores* of American social classes. and Allison Davis, 1943, on the behaviour patterns of lower class Negroes.) In a caste system the barriers are not permeable. The permeability index of a professional class is determined by a number of factors such as age, sex, educational level and special skills, socio-economic status of the parents and general economic conditions.

Social structure is, in a sense, independent of any given individual. But within it, each individual takes up a number of roles. These determine both his position in that structure and his potentialities of social behaviour. To refuse to take an available role means that the individual must go out of that framework without satisfying his needs. Where he seeks new roles will determine the direction of his social mobility and his social adequacy or adjustment. On the other hand, of course, a person in a region may be compelled to take a role because of impermeable barriers. How he adjusts himself will then be an indicator of his future social and personal stability. An example is the child in a highly authoritarian family or in a family replete with interpersonal tensions. About both of these cases I shall have more to say.

Without role assumption there can be no social relationships. In our roles, we establish relationships with employers, patients, pupils, teachers, parents, children and so on. One of the most important instruments in establishing relationships is language. But the quality and strength of these relationships depend on other factors. They depend, of course, indirectly on the type of job, or framework—whether, for instance, it is a routine,

mechanized job such as selling theatre tickets through a window or a more complex one such as curing someone of pneumonia, or designing a house for someone, or teaching. Directly, however, the quality and strength of social relationships depend on personalities, and personalities are themselves formed in a system of frameworks and roles, chiefly during infancy and youth in the family.

The fourth component of society, then, which Curle calls simply "culture", is the one that establishes the range, quality and strength of the social relationships between role-playing individuals. Culture is the means used by the individual to sustain his social relationships. Another way of looking at it would be to say that the fourth component is "personality", since that term implies the internalization in an individual of the values of his total culture pattern, both the one he lives in now and the ones he passed through in his developmental stages. Indeed, one definition of personality is "a system of needs operating within a system of roles".

The Criteria of Desocialization.

These considerations led Curle and Trist to formulate their three criteria of desocialization. The first is failure to take a role. In essence, this means failure by the individual to satisfy his needs through normal social channels. The second is failure to sustain social relationships. The third is a disturbance in the internal assimilation and integration of his culture. This implies that his perceptions of social reality are disturbed, which in turn leads him to use language inefficiently. A person who cannot communicate his needs, or communicates them in such a way that they are misunderstood or not understood at all, is clearly not normal.

Let us return to our example of what happens to the social perceptions of enlisted men. The important point to notice is that the desocialization process refers to a man's civilian life. If he is a good soldier, he is well adjusted to his army setting. It is his civilian roles, relationships and cultural values which are progressively attenuated. Moreover, many of the newly gained roles and relations conflict to some extent with the old. However, by and large that does not much affect his relations in the field, except perhaps to make him psychologically vulnerable in stress situations. It is when he returns home that the trouble starts. Most clearly can this be seen in the case of returned prisoners of war. They have suffered a yet greater reduction in their roles and relationships and have also suffered a breakdown of their institutional framework. Authority for them rested with the guards, and every prisoner was at war with it.

When a soldier, and especially a prisoner of war, returns home, he is faced with the problem of remaking his lost relationships and again acquiring roles. The task is made more difficult by three factors. First, his previous roles, relations and culture have been distorted by selective forgetting and fantasy formation. Secondly, the people he knew have changed: his children are older, his wife has had an independent job, his former workmates have a different outlook. Thirdly, the projections on to his family which he made while in the field return on him as guilt feelings. Perhaps he has wrongly accused them; perhaps they are guilty after all, and how then does one adjust oneself to working with a lot of guilty people?

As a result of these theoretical considerations backed by detailed studies of returned servicemen and prisoners of war, a group consisting of Trist, Curle and some psychiatrists formulated practical measures of rehabilitation. They are described in the paper on "Transitional Communities". Here we shall note only briefly that some 300 men (all volunteers), who were unable to adjust themselves to civilian life, and whose social relations both within and outside the family were deteriorating, were gathered together in spacious surroundings and were guided and encouraged to work out their problems. They were given psychological and psychiatric interviews, vocational guidance, occupational therapy and group therapy through group discussions. All of these are social instruments, and the increasing intensity of contact with life outside related the therapeutical procedures directly to social reality. In the civil resettlement units, as they were called, institutions, roles, relationships and culture were systematically restructured within the democratic framework of a participant society.

Psychiatric casualties, of course, still remained. A person may have regressed too far, or his family may in fact have so grown away from him that he can never again become in the fullest sense a member of that family. Many situations were not unlike those we found among the unemployed in Dundee. There, women were in work (because they got lower wages) and men had become "kettle-minders". But the surrounding culture was still male-dominant, so that unemployed men were in a continuous profound conflict over their social relations. So, among returned prisoners of war there were cases in which the wives' primary identifications were masculine and their relations to their husbands were deeply ambivalent. Having tasted the freedom and responsibilities of a job, they resented the return of the person who, in the eyes of society, was head of the household. They continued to cling to their new, symbolic masculine or father role. However, even in fairly bad cases often reasonable adjustment was made by drawing the families into the group discussions at the civil resettlement units. But there will, of course, always remain patients for whom the social therapy remains superficial, and who need individual deeper psychiatric treatment.

The Function of Interpersonal Communication.

Up till now I have been concerned with general principles in social psychology, and with the attitude of the psychologist to processes such as desocialization and the epidemiology of projection. I now want to consider one more crucial factor in the ætiology of mental ill health, for this will bring us to that focal area in which the functions of the psychologist and the psychiatrist begin to overlap or to run in harness, and in which the general medical practitioner can and should also participate. This is communication, the major factor by which our social relationships are established and maintained.

My starting point is an interesting paper by Theodore M. Newcomb (1947). His thesis is as follows:

> The likelihood that a persistently hostile attitude will develop varies with the degree to which the perceived inter-personal relationship remains autistic, its privacy maintained by some sort of barriers to communication. . . . Attitudes are matters of judgment and perception which must take place within a frame of reference. If communication with others is cut off, the initial framework responsible for the perception of hostility is less likely to be modified than if interpersonal give-and-take is continued.

Newcomb points out that personality disturbances are commonly discussed in terms of evasion, or escape from, or transformation of, "reality", and asks what is the nature of this "reality". He shows that what is disturbed or distorted is some aspect of a cultural norm incorporated into the personality. Ordinarily, we maintain our "normality" by constant reference to others, through processes of intercommunication. The cultural deviant no longer communicates with others, except perhaps with others of the same kind. Newcomb suggests that repression is equivalent to inability to communicate. We can see the strength of this by considering, for instance, a region in which communication between parents and children is practically taboo in most families—the region of sex. It is in "private" regions, that is, regions inaccessible to communication, that autisms or personality disturbances flourish. Reality, then, means "social reality".

Now it makes a great practical difference whether interpersonal relations and communications are regarded as central or as peripheral to psychiatric practice. In the one case, a patient is examined alone by the psychiatrist, who interprets to the patient, helps him to face his conflicts and anxieties, and attempts to connect him again with reality. In the other, group therapy becomes practicable. Here, a group of maladjusted individuals begin slowly and painfully to communicate experiences to each

other and, by losing their sense of uniqueness and isolation, themselves reestablish contact with reality.

These two methods, however, are closely related. According to psychoanalytic theory, the therapist utilizes the phenomenon of transference. In the transference situations the patient, for example, may come to regard the analyst as the father, and may work out his repressed conflicts as though he were communicating directly with the father. If the repressed is so surrounded by barriers against communication that it cannot become public at all in a group, then the only way out is by means of the relation to a psychoanalyst. But in both cases communication—that is, breaking defensive autisms—is the crucial factor.

Clearly mere communication in words is not enough. The words have to carry certain meanings, which implies that the other person or situation has to be placed in a new frame of reference. And this new frame of reference gives to the other person a different role or status. At the same time this altering of the frames of reference and dropping of the barriers to communication means that the person gains insight, in the sense that he perceives not only the other as hostile, but his own actions as they are perceived by the other. That is, it becomes possible to interpret new meanings in the behaviour of others, to take on their role and so complete the two-way process of communication. As Newcomb puts it, "the interpersonal conflict becomes a situation in which he is involved rather than a hostile force with which he is confronted". Having done this in the presence of the therapist or the therapeutic group (as in Moreno's sociodrama with its "audience" and "auxiliary egos"), he is able to do it in the real situation also. As impressions that the behaviour of others is hostile disappear, so it becomes less necessary to maintain hostile expressions oneself.

We have seen that frustration leads to aggression and to projection, which is a psychological mechanism. This projection alters the perception of the status relationships between people, the meanings carried by their roles and role-relationships. This in turn leads to a breakdown in communication, to a strengthening of barriers in various regions of social space.

Now this encapsulation of the person in a self-made symbolic world does not necessarily exclude him from his fellows. Whole groups of people may develop the same autisms, share the same projective devices, and by communicating them to each other strengthen them by a process of social reinforcement. In an individual, we speak of an attitude; in the case of shared attitudes we speak of prejudice. Thus there are groups who show prejudice to Roman Catholics or to Protestants, to Negroes or to whites, to socialists or to capitalists, and so on. Prejudice leads to discrimination, and discriminatory practices in turn create new attitudes and so more prejudice.

The aim of much legislation is to enforce fair practices. For instance, laws have been made against child labour and sweated labour in general. Such legislation in itself cannot, of course, create new attitudes; it merely alters behaviour, which can be dealt with by law. But when a government itself makes discriminatory legislation about matters of belief and controversy, new prejudices are created, and then society is very sick indeed and in urgent need of psychiatric treatment. For discriminatory legislation about matters of belief is itself the product of projection, and it opens the door wide to the paranoid, the person with a grudge, in short, the potential informer. The fine flower of such legislation can be seen in all authoritarian states. Its psychological roots have been dissected in Lieutenant-Colonel Dick's monographs on the "Psychological Foundations of the Wehrmacht" and his analyses of the authoritarian character.

In my opinion it behoves psychiatrists to guard the public against such psychological viruses as the public health inspector guards against the contamination of food. Unfortunately psychiatric training as yet includes only one of the four components of society, culture as it is internalized in the individual personality, and then only its pathological aspects. The study of the normal is confined to psychologists. To use a medical analogy, psychiatrists are like doctors who have never studied general physiology but have confined themselves to the pathological laboratory. I shall elaborate this statement in my next lecture, when I hope to show also how this condition can be overcome.

Let me attempt to sum up the main themes of this paper. So far I have been designedly discursive. My intention has been to start from a specific example of what is perhaps not usually regarded as a mental illness—the desocialization of troops—to follow some of its ramifications and implications, and to show that in desocialization we have a prototype of mental epidemiology, and in its treatment a model for cure.

The first theme was that personality is a construct which implies the development of a person in a number of social settings, and whose basic dynamics are expressed in the phrase "a system of needs that are satisfied in a system of roles". When dislocation occurs in the system of roles, desocialization begins. With it, the importance of projection as a tension-relieving device increases. At the same time, however, projection on to certain objects, situations or persons becomes habitual and stereotyped. This is the genesis of prejudice between groups, as it is the genesis of attitudes of rejection or hostility between persons.

Another illustration of this is the effect on children of tensions in the home. Mr. S. B. Hammond[1] has found, for instance, that in broken homes children do less work in the house, although there is more need for their help because of the absence of either father or mother. Part of the role structure of the home has been destroyed, part of the possibilities of affectional role identification is missing. Another illustration is that there is a 0·7 correlation between adjustment at home and adjustment at school as measured by peer-group popularity. In other words, adjustment is a function of the stability of affectional patterns at home, and these patterns are based on the roles assigned to, and perceived by, the parents and the children.

In a large city like Melbourne, there is a considerable lack of positive community structure and therefore of community identifications. This finding of urban desocialization confirms studies that have been made in many parts of the world, particularly in the United States of America. Now here in Melbourne the persons who are most acutely affected by desocialization are the housewives. They almost universally lack citizen roles. Owing to their being confined so closely to the roles of cook, charwoman, nurse and mother, they have few outside interests. And the housing shortage falls most heavily on their shoulders. It will not surprise you, therefore, that females here are more highly prejudiced than males.

Children acquire prejudice not through experience but by contact with the attitudes of adults—this again confirms studies made elsewhere. Consequently the high incidence of prejudice among females can be considered as a matrix for the social disease of projection. As I mentioned earlier, in such a situation discriminatory legislation against groups could very easily become the precipitating factor in a severe outbreak of projective phobias, and, if they have any sense of social responsibility, psychologists and psychiatrists should take prophylactic measures.

Among the most important prophylactic measures—this is the second theme—is the removal of barriers to communication and the bringing of the perception of the roles of others closer to reality. Experimental studies have shown that in the industrial field, group decisions following upon group discussions that have centred on better understanding of the various roles of workers, supervisors and management have been followed by increased output and decreased tensions between individuals. In the same way it was shown that the amount of "scapegoating" in a group of adolescents could be increased or decreased by changing the control of the group from authoritarian to democratic. As you know, in authoritarian control, communication is mainly one way. "Their's not to reason why."

[1] This work is part of the Australian contributions to studies being carried out in several countries for the UNESCO Social Tensions Directorate, which will be published in 1951.

As yet we have little experience of large-scale methods of breaking barriers behind which autistic hostility grows. We do know two things, however. The habit of seeking solution to tensions by means of projection begins young. Psychiatrists, especially those with psychoanalytic background, have demonstrated that the roots of all neuroses lie in infancy and childhood, in faulty ways of establishing equilibria between needs and roles. Secondly, in school —where children spend the bulk of their time—the opportunity to practise roles, especially citizenship roles, and to communicate is so fantastically restricted as itself to be a comment on the neurotic desocialization of our times.

A few weeks ago the Department of Psychology of this university carried out an experiment in changing the attitudes of some 300 teachers in the direction of a more democratic control of the classroom, by grouping children according to their own sociometric choices and by allowing greater freedom of association and therefore of role practice and communication. I have many reasons for believing this experiment to have been successful. In other words, through the educational system much can be done to mitigate the dangers inherent in urban desocialization. Here, too, is a field in which the collaboration of psychologists and psychiatrists is needed. I shall refer to this in more detail in the next lecture. Suffice it here to give one illustration: it has been found that the number of maladjusted children is much greater in a class controlled by a maladjusted teacher. This, too, is an example of the contagious nature of mental disease. It also illustrates one road to "the early treatment of insanity" with which the Beattie-Smith memorial lectures should be concerned.

INTRACTABLE PAIN AS A SURGICAL PROBLEM: SOME CONCLUSIONS ON THE RELIEF OF PAIN BY OPERATIONS UPON THE CENTRAL NERVOUS SYSTEM.

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OF all symptoms of disease for which the medical profession is consulted, pain ensures the earliest and most urgent pleas for help. A child may go blind without telling anybody, but a pain makes it scream; adults will ignore a swelling or an unsteady gait indefinitely, but pain soon brings an appeal for assistance. Then it is customary to search for the cause and direct treatment towards it, regarding pain as merely an incidental symptom. However, there comes a stage in some diseases in which the lesion is beyond treatment, which may then need to be aimed at the symptom of pain, because intractable and unrelieved pain is a torment which can entirely take charge of the unfortunate victims' whole existence. Their days and nights are marred by suffering and their every movement elicits it, so that eventually, in a longer or shorter time, according to individual make-up, morale is broken and they become wretched and complaining wrecks, making the lives of those in contact with them as miserable as their own. Such a stage should rarely be reached in this day and age, because, when drugs fail or become ineffective, a surgical attack upon pain is available, which in most cases will offer considerable if not complete relief.

There are several types of patient calling for treatment. The foremost group are those sufferers from malignant disease in whom a neoplasm has broken its bounds to make attachments to parietal structures and nerves. Chief amongst these are the invasions of the lumbo-sacral plexuses by pelvic tumours and of the brachial plexuses by cervical growths or malignant glands; but there are many other possibilities which need not be enumerated.

A second group includes those with intractable neuralgia of doubtful or unknown origin, such as trigeminal and glosso-pharyngeal neuralgia, painful phantom limb and causalgia; while yet another group includes those suffering from pain resulting from various internal diseases—for example, *angina pectoris* and the intractable strangury of chronic urethro-vesical disease.

This paper deals mainly with the relief of pain having a neoplastic basis by operations upon the central nervous system. There is no attempt to discuss the surgery of the sympathetic nervous system, which plays no small part in the treatment of certain types of pain, nor will more than incidental reference be made to pain of other than malignant origin.

The Patient with Incurable Malignant Disease.

When surgery or radiotherapy has failed to arrest a malignant condition and pain of increasing severity occurs, it is essential to try simple measures, the use of drugs being the first. In so far as pain can be relieved by the ordinary non-habit-forming analgesics, no further steps need be contemplated; but when they lose their efficacy and morphine becomes necessary, there are certain factors to be considered. The continued administration of morphine will initiate addiction; so, before countenancing this, one should estimate the possible span of life left to the patient as well as his degree of pain. Should an early demise seem unlikely, he should not be made dependent upon morphine if an alternative can be offered. This immediately raises the question of how long a period before death unrestricted morphine administration is permissible, and it is, to say the least of it, a highly controversial point, to which the answer must be largely a matter of personal opinion. When secondary deposits are widespread and death is likely within the ensuing two or three months, it is the writer's opinion that morphine should not be withheld; but if the end is not predictable, operative procedures may be considered. The principle of most of these methods is to interrupt the path of conduction of pain at some acccessible point between its origin and central termination. The ideal place for such sections would be where permanent relief with minimal operative risk to the life and activity of the patient was guaranteed; but in practice this can seldom be realized. Operations upon the central nervous system always carry a risk with them, and this is especially so when the subject is one who, by the very nature of his disease, would be turned down for most other procedures. This, however, should not be a contraindication to the type of operation under review—one's primary object is to relieve pain, and if this can be achieved, and the patient's few surviving months rendered comfortable, it is justifiable to operate in the face of risk.

The Path of Pain Conduction.

Impulses causing pain are received peripherally by free nerve endings and plexuses lying in the subepidermal and epidermal layers of the skin. Thence they travel in peripheral nerves and posterior nerve roots to the spinal cord, where they are segregated to ascend four or five segments in the dorso-lateral tract of Lissauer. They then end in cells of the posterior column of grey matter, whence fibres of the second relay arise and cross in the anterior grey commissure to the antero-lateral region of the white matter of the opposite side. Here they form the spino-thalamic tract, which is not a compact bundle, but rather a scattered complex extending from near the denticulate ligament laterally to within three millimetres of the midline anteriorly—such is the conclusion reached from a study of the clinical state of affairs after cordotomy (Figure I). The topographical arrangement of fibres within this tract is such that those most recently acquired lie medially and are displaced laterally by the next ones entering above; thus, in the cervical region, the fibres from the most caudal regions of the body come to lie well laterally, whilst those from higher levels are most anteriorly and medially placed (Figure I). The tract travels upward through the brain stem, its location varying from level to level, those structures of surgical importance being illustrated in Figures II and III, and ends in the cells of the postero-lateral ventral nucleus of the thalamus, which in turn gives rise to fibres projected upon the post-central gyrus of the cerebral cortex.

In the periphery, pain conduction can be interrupted by the section of cutaneous (or mixed) nerves—a procedure

which has a limited use as a temporary measure. When dealing with malignant disease one is usually confronted with pain of a much more widespread nature, which requires section of the pain path either at the posterior roots or in the spino-thalamic tracts.

Posterior Rhizotomy.

First performed in 1888 by Bennett for painful phantom limb, the operation of dividing the posterior nerve roots central to the ganglion was further developed in attempts to control the visceral crises of *tabes dorsalis*. The pioneers aimed at cutting a sufficient number of roots to ensure anæsthesia in the entire area to which pain was referred. Amongst these early cases there were successes which were both striking and lasting, but only too often pain returned after an interval, though it was usually in much modified form. However, results were sufficiently encouraging to stimulate interest in the operation, its use having since been explored in such diverse conditions as painful amputation stumps and phantom limbs, *angina pectoris*, cancer pain, post-herpetic neuralgia and certain other neuralgias of obscure ætiology. Referring to the pain of malignant invasion, rhizotomy has certain shortcomings. All too frequently the lumbo-sacral or brachial plexuses are invaded, the result being diffuse pain over a wide area of the leg or arm, so that, to obtain adequate anæsthesia, the posterior roots of all the nerves to the involved limb must be divided—in other words, the limb must be deafferented. This in itself is undesirable, because such a limb is an ataxic, uncontrollable member, which may well be as big a trial as the original pain. In addition, even though satisfactory anæsthesia be produced, one cannot guarantee that pain will be controlled, the occasional persistence of pain in anæsthetic areas being an unpredictable and inexplicable pitfall.

Certain localized, segmental neuralgias may respond extremely well to rhizotomy, among which should be mentioned occasional cases of post-herpetic neuralgia with associated hyperæsthesia. It can also be considered in conjunction with a cordotomy requiring a high sensory level, rhizotomy being used to raise the level above that obtainable by cordotomy alone. Good results have been reported in a number of cases of anginal pain. Haven and King reported five patients, of whom four were free from all pain six, ten, twelve and fifteen months after operation. The other patient progressed well for three days and then had a completely painless coronary occlusion, which was fatal in fourteen hours.

Spino-Thalamic Tractotomy.

In the Spinal Cord.

The spino-thalamic tracts can be divided at several levels—in the antero-lateral columns of the spinal cord, in the lower part of the *medulla oblongata* and in the upper part of the pons or mesencephalon. It is most frequently performed in the spinal cord for the relief of pain below the level of the sixth thoracic segment. The result of operation is to cause analgesia and therm-anæsthesia on the side of the body opposite the section; in this area sensibility to light touch is retained and there is no loss of proprioceptive sensation. In the analgesic area pain is abolished; this, combined with the preservation of touch, savours of the perfect operation. Furthermore, the operation can be performed bilaterally at one sitting, though it is essential that each section be at a different level of the cord to obviate any risk of causing a transverse lesion.

The main application of this procedure is to abolish the pain of pelvic growths, whether this be mid-line and visceral or radiating down one or both legs; but its use is not confined to cancerous pains—it is of benefit in such conditions as painful osteoarthritis of the hip, intractable cystitis and lesions of the *cauda equina*. When performed for pain at these levels it is usually carried out at one of the lowest cervical or uppermost thoracic segments, according to the individual preference of the surgeon. It involves laminectomy of two or three vertebræ and incision of the cord at the selected segment—no very formidable procedure for a healthy patient; but, as it is most often performed on "poor risk" patients advanced in malignant disease, there is an inevitable small mortality rate.

Tractotomy can also be performed in the high cervical region for pain in the upper limbs; but at these levels it is more hazardous and the results are less satisfactory

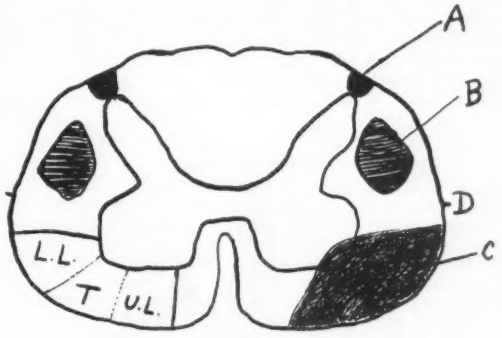

FIGURE I.

A, Lissauer's tract; B, the pyramidal tract; C, the area cut in antero-lateral tractotomy; D, denticulate ligament; L.L., approximate extent of fibres from lower limb; T, approximate extent of fibres from trunk; U.L., approximate extent of fibres from upper limb.

because it is never easy to achieve a sufficiently high level of analgesia, without which pain is inadequately relieved. The obstacle to attaining this is the oblique crossing of the pain fibres, so that a section at one cord segment results in a cutaneous level three to five segments lower. To obviate this disparity, section of posterior roots has been added to ensure as high a level as possible.

Attractive as cordotomy appears, at any rate for the lower levels of pain, it still has its pitfalls which cannot be glossed over. The mere site of section (Figure I) endangers the pyramidal tract unless the landmarks are known and identified with certainty, and post-operative retention of urine is not uncommon, especially after bilateral operations, but this clears up almost invariably within a few days. Another disconcerting sequel is the occurrence of girdle pains at the upper level of analgesia, which may be severe and resistant to treatment, though they tend to settle down as time passes. This complication is fortunately not common, for its cause is not known. Lastly, the relief of pain may not be permanent—there are reports of patients who, after a year or more, have had a return of pain, possibly because fibres in other tracts have developed the function of conducting painful impulses. However, this need not be a consideration in malignant disease, because the patient's life span is seldom long enough to allow time for recurrence; but it does obscure the indications for tractotomy in other conditions. Fortunately, recurrence is an exception and not a rule, so it should not be a bar to operation if cordotomy is the operation of choice.

To sum up, then, cordotomy has its most useful sphere of application for intractable pain below the sixth thoracic segment, especially when malignant disease is at the source. Satisfactory results have been obtained, though with less regularity, when the upper limb is involved; but the higher the segmental level of pain, the more uncertain is its relief. Posterior rhizotomy may be combined with cordotomy to raise the level of analgesia.

In the Medulla Oblongata.

Following Sjöqvist, who first divided the descending tract of the trigeminal nerve in the *medulla oblongata*, several workers have sectioned the spino-thalamic tract at a similar level in attempts to overcome the shortcomings of high cervical cordotomy. It was hoped that interruption of these tracts at medullary levels might produce, with more certainty, a higher sensory level, so providing an unfailing answer to the intractable brachial neuralgias; but despite a number of successes it has not altogether fulfilled expectations.

The operation is carried out preferably with the patient in the sitting posture, a suboccipital approach being made to gain access to the contents of the posterior cranial fossa. The site chosen for the section has varied slightly according to the preference of the surgeon, but it is usually made at the level of the lowest vagal rootlets, from which it must extend ventrally, and to ensure the highest zone of analgesia it should be 4·5 to 6·0 millimetres deep (Figure II).

FIGURE II.

A, spinal tract of trigeminal nerve; V, vagus nerve with fibres coming from the dorsal nucleus and *nucleus ambiguus*; M, extent of the section made in medullary spino-thalamic tractotomy, maximum depth six millimetres; O, inferior olivary nucleus; S.T., spino-thalamic tract, showing division into four segments representing suggested topography with the fibres from the cervical and arm regions lying medially, the sacral fibres laterally, and the lower limb and trunk fibres in intermediate positions (after Schwartz and O'Leary).

Crawford (1947) reported 11 cases in which levels at the third or fourth cervical dermatome were obtained with regularity, and in eight cases the results were lasting. However, there were three deaths in the series, two of these patients having had bilateral operations. Schwartz and O'Leary reported one case with a satisfactory sensory upper limit, but a fatal outcome two days after operation, and another in which analgesia went as high as the first thoracic segment and hypoalgesia up to the sixth cervical segment. Adams and Munro obtained levels only as far as the eighth cervical dermatome in two cases, in both of which a deep medullary cut was made. White reported one case in which he obtained analgesia to the sixth and hypoalgesia to the first cervical region, but the patient was rather ataxic when standing after operation.

Thus it appears that, though the operation can be completely satisfactory, it has the disadvantage of carrying a fairly grave risk to life, which must be taken with the knowledge that the relief of pain cannot be guaranteed. At present it would be wiser to display caution, and, while realizing that the operation is available, to avoid it if a surer method of achieving a satisfactory result can be offered.

In the Mid-Brain.

The highest level at which the spino-thalamic tract may be divided is at the level of the inferior colliculi. Here the tract lies superficially in close association with the lateral lemniscus (Figure III), the deep lateral sulcus of the mesencephalon being the surface guide to its location. If entrance is made here and the incision carried dorsally until the brachium of the inferior colliculus is severed, complete hemianalgesia and hemithermanæsthesia of the opposite side of the body, including the face, can be produced. The actual depth of the incision has varied from 2·0 to 5·0 millimetres, according to the surgeon.

This operation has not been in wide use and no clear-cut indications for its performance can be tabulated. Dogliotti, to whom belongs the credit of the first successful cases, devised it for the treatment of "diffused rebellious pain", while Walker, who further explored its range of usefulness, operated for a thalamic syndrome involving one entire side of the body, for causalgic phantom limb, and for metastatic carcinoma with severe pain in the neck and face. This procedure should still be regarded as being *sub judice*, and before embarking upon it one must consider whether other procedures may not be safer, though still achieving the same result. For example, may not pain in the face and neck be equally well treated by division of either the sensory root or descending tract of the trigeminal nerve

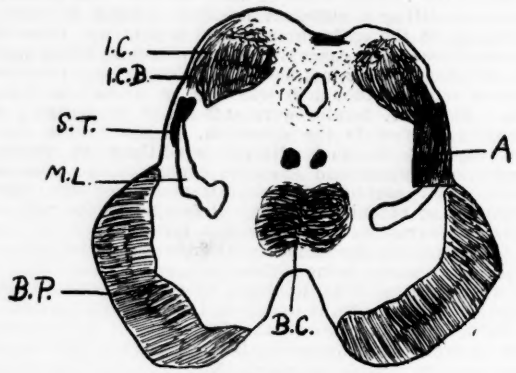

FIGURE III.

I.C., inferior colliculus; I.C.B., brachium of inferior colliculus; S.T., spino-thalamic tract, which is not a compact bundle, but probably more scattered than shown here; M.L., medial lemniscus; B.P., *basis pedunculi*; B.C., decussation of *brachia conjunctiva*; A, representation of the cut made in mesencephalic tractotomy.

in the posterior fossa, together with section of the glosso-pharyngeal nerve and the requisite number of posterior roots? This in itself cannot be lightly undertaken, for it is an extensive procedure; but it is probably indicated far more often than mesencephalic tractotomy, which produces such widespread effects. Certain disagreeable sequelæ may follow the latter procedure also — paræsthesiæ are not uncommon, and in one of Walker's cases amounted almost to causalgia; stimulation of the anæsthetic side by heat, cold or pin-prick sometimes causes unpleasant sensations, while homonymous hemianopia regularly occurs as a transient post-operative phenomenon.

The Intracranial Division of Sensory Nerves.

The relief of pain in the face, mouth, jaws, tongue and throat is the subject of an extensive literature, and it can be dealt with only briefly here. The sensory nerves involved in the supply of this area are the trigeminal and glosso-pharyngeal nerves together with the small auricular branch of the vagus. Malignant disease in these regions can set up pain of an intolerable nature, which is rendered even more so when ulceration occurs onto mucous surfaces, with consequent infection accompanied by fœtor. Division of the appropriate nerves is nearly always of great benefit in such cases. It is vitally important to analyse exactly the distribution of the pain so that the entire painful area may be rendered numb; also it is well to take into account the possible spread of the disease and divide more widely to obviate recurrence of pain in a neighbouring sensitive area. Pain that is first confined, say, to the second and third divisions of the trigeminal nerve will probably spread sooner or later to the first division as the neoplasm advances; therefore selective root section, which is useful for *tic douloureux*, has no place in the treatment of trigeminal neuralgia having a malignant basis. Similarly, a carcinoma of the tongue producing trigeminal pain may easily overflow onto the area of glosso-pharyngeal supply, and one must consider division of both these nerves. These are well tried and satisfactory procedures affording gratifying relief and carrying no great risks in their performance. They should not be denied patients suffering pain in the head, neck and throat.

Prefrontal Leucotomy.

Chronic pain, especially if it is severe and unrelenting, imposes more than a mere physical trial upon the victim—there is also a psychological factor which is an unpredictable quantity, depending largely upon the make-up of the individual. However, there comes a time even for the most stoical when morale and endurance are broken down by the continuous onslaught of pain which comes to colour their whole lives and influence their every act or demand—it assumes, in fact, an obsessional nature. Their distress becomes disproportionate to the degree of pain or, if they have momentary relief, their respite is wasted because they live in terror of the return of their torment. When such conditions have developed, the problem of the relief of pain is predominantly one of psychological treatment.

When the operation of prefrontal leucotomy was first suggested its primary object was the alleviation of various psychoses, but it was noticed as a side effect that some of the patients who had had pain ceased to complain of it after operation. This led to the concept that pain which had an obsessional element might be treated by leucotomy, and this has now been extensively practised with many excellent results. It cannot be lightly undertaken because personality changes are prone to follow operations upon the frontal lobes, though this can rarely be an objection when intractable pain has already caused a change for the worse.

After leucotomy mental changes tend to fall into one of two groups of behaviour patterns—the euphoric and the retarded. The former patients are uninhibited and overactive, whilst the latter are slowed up in thought, speech and action. Also patients may respond inappropriately, their reactions to any set of circumstances being out of place or even embarrassing, and most of them show a lack of initiative.

The operation in use until recently was performed bilaterally to sever the connexions of the prefrontal cortex with the rest of the brain, and particularly with the thalamus. It is after this procedure that personality changes are most pronounced, so in order to obviate them a unilateral division has been used, with which there have been encouraging reports both in the relief of pain and in the absence of mental alterations.

The bilateral operation is a most valuable weapon against pain, and good results may be expected in a large proportion of cases, though it must be accepted that there are some failures which are, unfortunately, unpredictable before operation. It should be understood that leucotomy does not interrupt any known pain path—rather is it aimed at the relief of suffering as opposed to pain. It removes the fear of pain and death, and it relieves constant emotional tension. Post-operative questioning often brings forth the response that the pain is as bad as ever, and circumstantial proof of relief must be sought. This is usually evident because there is no spontaneous complaint of pain; apprehension and misery disappear; appetite increases and more interest is taken in normal events; and, perhaps above all, no drugs are demanded, even when there has been immediate and total withdrawal of morphine in cases of addiction. It is an interesting fact that symptoms of deprivation rarely occur in such cases. Dynes and Poppen reported 18 patients, of whom nine had cancer, and they observed that better results were obtained in this group than in the other nine with pain of different origins.

To obviate personality changes, leucotomy has been carried out on one side only in a number of cases. Scarff has reported the largest series to date, and his results are encouraging. There were 33 cases, a good result being obtained in 22, his standard of a good result being no spontaneous complaint of pain and no need for narcotic drugs. There were five poor results, and six results were regarded as only fair. Before operation there were 15 drug addicts, all of whom recovered without withdrawal symptoms except one, in whom they occurred for only three days. In no case was there any significant decline in intellect or personality, though in some a transient minor loss was demonstrable by formal testing for a few weeks after operation.

If the unilateral procedure fails there is no contraindication to operation on the opposite side later, and in the writer's opinion this is a good routine to follow, several weeks being allowed to elapse for observation and assessment before the more extensive bilateral procedure is proclaimed necessary. The operation itself is of no great technical difficulty and can be carried out easily through trephine holes. The main risk is hæmorrhage, which should be carefully controlled before the wounds are closed. There is a remote risk of the development of post-traumatic epilepsy, so that the use of barbiturates is wise after these operations.

Conclusions.

The foregoing is an account of the better known operations upon the central nervous system which may be of use in the relief of intractable pain. There is not amongst them a panacea for all ills, but by wise selection an answer can be found far more often than not. It should no longer be necessary for anyone to suffer during his final months of decline from malignant disease; neither should pain be a constant accompaniment for those with many other chronic non-malignant conditions. Certainly there are several only partially solved problems, such as the causalgias and phantom limb pains, and the choice of the best method of attack can be hard to decide. One warning is not out of place: there are many people who develop pain for which no good organic reason can be found, though their pain may be, to them, persistent, intolerable, even agonizing; but no division of anatomical tracts can possibly bring any benefit, for their pains are of some obscure origin, frequently with a psychological basis. Such people do not present neurosurgical problems—in fact, any area of numbness usually becomes the source of further complaint, and the surgeon is dogged by an unrelieved pain to which his well-intentioned operation has added numbness. It is important that this type of case be recognized in time if the surgery of pain is not to acquire a bad reputation, for there is much the surgeon can do with a wisely selected operation.

Summary.

1. The causation and effects of intractable pain are considered in general terms, and a course of management of a patient with pain from malignant disease is suggested.

2. The anatomical route of pain conduction is briefly described.

3. Several operations upon the central nervous system at present in use for the relief of pain are discussed in some detail, with special reference to their applicability in certain types of cases and the degree of benefit to be anticipated.

4. A brief *résumé* of the development of prefrontal leucotomy as a method of attack upon pain is given, together with an indication of the alterations in the psychological state which may be expected after its use.

References.

Adams, R. D., and Munro, D. (1944), "Surgical Division of the Spinothalamic Tract in the Medulla", *Surgery, Gynecology and Obstetrics*, Volume LXXVIII, page 591.

Bankart, A. S. B. (1929), "Chordotomy in the Treatment of Osteoarthritis of the Hip", *The Lancet*, Volume II, page 378.

Beer, E. (1913), "Relief of Intractable Pain due to Metastases Pressing on Nerve Plexuses", *The Journal of the American Medical Association*, Volume LX, page 267.

Bucy, P. C. (1942), "The Neurosurgical Relief of Pain", *Surgical Clinics of North America, Volume XXII, page 161.*

Crawford, A. S. (1947), "Medullary Tractotomy for Relief of Intractable Pain in Upper Levels", *Archives of Surgery*, Volume LV, page 523.

Dogliotti, M. (1938), "First Surgical Sections, in Man, of the Lemniscus Lateralis at the Brain Stem, for the Treatment of Diffused Rebellious Pain", *Current Researches in Anæsthesia and Analgesia*, Volume XVII, page 143.

Dynes, J. B., and Poppen, J. L. (1949), "Lobotomy for Intractable Pain", *The Journal of the American Medical Association*, Volume CXL, page 15.

Foerster, O. (1911), "Resection of Posterior Spinal Nerve Roots in the Treatment of Gastric Crises and Spastic Paralysis", *Proceedings of the Royal Society of Medicine* (Section of Surgery), Volume IV, page 226.

———— (1913), "On the Indications and Results of the Excision of Posterior Spinal Nerve Roots in Man", *Surgery, Gynecology and Obstetrics*, Volume XVI, page 463.

Frazier, C. H. (1918), "Rhizotomy for the Relief of Pain", *The Journal of Nervous and Mental Disease*, Volume XLVII, page 343.

———— (1920), "Section of the Anterolateral Columns of the Spinal Cord for the Relief of Pain", *Archives of Neurology and Psychiatry*, Volume IV, page 137.

Freeman, C. W., and Heimburger, R. F. (1947), "Surgical Relief of Pain in Paraplegic Patients", *Archives of Surgery*, Volume LV, page 433.

Freeman, W., and Watts, J. W. (1946), "Pain of Organic Disease Relieved by Prefrontal Lobotomy", *Proceedings of the Royal Society of Medicine* (Section of Psychiatry), Volume XXIX, page 443.

Gardner, E., and Cuneo, H. M. (1945), "The Lateral Spinothalamic Tract and Associated Tracts in Man", *Archives of Neurology and Psychiatry*, Volume LIII, page 423.

Grant, F. C. (1930), "The Value of Cordotomy for the Relief of Pain", *Annals of Surgery*, Volume XCII, page 998.

———— (1932), "Results with Cordotomy for Relief of Intractable Pain due to Carcinoma of the Pelvic Organs", *American Journal of Obstetrics and Gynecology*, Volume XXIV, page 620.

———— (1941), "Surgical Methods for the Relief of Pain", *The Journal of the American Medical Association*, Volume CXVI, page 567.

Haven, H., and King, R. L. (1942), "Section of Posterior Roots for the Relief of Pain in Angina Pectoris", *Surgery, Gynecology and Obstetrics*, Volume LXXV, page 208.

Hey Groves, E. W. (1911), "On the Division of the Posterior Spinal Nerve Roots", *Proceedings of the Royal Society of Medicine* (Section of Surgery), Volume IV, page 200.

Hyndman, O. R., and Wolkin, J. (1943), "Anterior Cordotomy", *Archives of Neurology and Psychiatry*, Volume L, page 129.

Kahn, E. A. (1933), "Anterolateral Chordotomy for Intractable Pain", *The Journal of the American Medical Association*, Volume C, page 1925.

Le Gros Clark, W. E. (1944), "The Anatomy of the Nervous System", *The Journal of Mental Science*, Volume XC, page 36.

Miscellaneous Authors (1914), "On the Resection of the Posterior Spinal Nerve Roots (Rhizotomy)", *The British Journal of Surgery*, Volume II, page 205.

Nesbit, R. M. (1947), "Anterolateral Chordotomy for Refractory Interstitial Cystitis with Intractable Pain", *The Journal of Urology*, Volume LVII, page 741.

Otenasek, F. J. (1948), "Prefrontal Lobotomy for the Relief of Intractable Pain", *Bulletin of the Johns Hopkins Hospital*, Volume LXXXIII, page 229.

Scarff, J. E. (1948), "Unilateral Prefrontal Lobotomy with Relief of Ipsilateral, Contralateral and Bilateral Pain", *The Journal of Neurosurgery*, Volume V, page 288.

———— (1949), "Unilateral Prefrontal Lobotomy for the Relief of Intractable Pain and Termination of Narcotic Addiction", *Surgery, Gynecology and Obstetrics*, Volume LXXXIX, page 385.

Schwartz, H. G., and O'Leary, J. L. (1941), "Section of the Spinothalamic Tract in the Medulla with Observations on the Pathway for Pain", *Surgery*, Volume IX, page 183.

Shaw, R. C. (1924), "A Study of Intractable Pain Relative to Rhizotomy and Spinal Section", *The British Journal of Surgery*, Volume XI, page 648.

Sjöqvist, O. (1937), "*Ein neue Operationsmethode bei Trigeminusneuralgie: Durchschneidung des Tractus spinalis trigemini*", *Zentralblatt für Neurochirurgie*, Volume II, page 274.

Spiller, W. G., and Martin, E. (1912), "The Treatment of Persistent Pain of Organic Origin in the Lower Part of the Body by Division of the Anterolateral Column of the Spinal Cord", *The Journal of the American Medical Association*, Volume LVIII, page 1489.

Sweet, W. H. (1947), "Relief of Pain by Operations on the Central Nervous System", *Surgical Clinics of North America*, Volume XXVII, page 1254.

Temple, F. (1947), "Observations and Results from Intracranial Section of the Glossopharyngeal and Vagus Nerves in Man", *The Journal of Neurology and Psychopathology*, Volume VIII, page 110.

Verbrugghen, A. H. (1945), "Chordotomy for Intractable Pain", *Medical Clinics of North America*, Volume XXIX, page 98.

Walker, A. E. (1940), "The Spinothalamic Tract in Man", *Archives of Neurology and Psychology*, Volume XLIII, page 289.

———— (1942), "Relief of Pain by Mesencephalic Tractotomy", *ibidem*, Volume XLVIII, page 865.

White, J. C. (1941), "Spinothalamic Tractotomy in the Medulla Oblongata", *Archives of Surgery*, Volume XLIII, page 113.

Wyke, B. D. (1947), "The Pain Pathway", *Bulletin of the Post-Graduate Committee in Medicine, University of Sydney*, Volume III, page 1.

CONGENITAL DEAF-MUTISM, PIGMENTARY DEGENERATION OF THE RETINA, AND AMENTIA.

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. . . Eyes and ears,
Two traded pilots 'twixt the dangerous shores
Of will and judgement.

—SHAKESPEARE.

THE occurrence of congenital deaf-mutism, pigmentary degeneration of the retina and amentia in any one patient is of interest for several reasons. Firstly, although it is not uncommon for each of these abnormalities to occur alone, or for congenital deaf-mutism to be associated with amentia, it is comparatively rare for a combination of all three to be found in the one individual. Secondly, it is interesting to speculate as to why they should occur together. Thirdly, one may ask, can the various degrees of mental defect often associated with deaf-mutism be prevented? Fourthly, such a combination of abnormalities provides a meeting place for the otologist, the ophthalmologist, the psychiatrist, the psychologist and the educationist. Anything that can bring these specialties together in a common quest is of interest and value.

How frequently is primary pigmentary degeneration of the retina associated with congenital deaf-mutism and other abnormalities? Nettleship (1909) seems to have been the earliest in the field with an answer to this question. He analysed 976 families carrying the taint of pigmentary degeneration of the retina. These families contained no less than 1681 persons who suffered from the disease, and of these persons about one-third were deaf. He also stated that 4% of deaf-mutes developed pigmentary degeneration of the retina. Dax (1940) reviewed the subject of pigmentary degeneration of the retina, especially with reference to evidence of associated degenerative lesions. He divides the latter into two groups: (i) the Laurence-Moon-Biedl syndrome and its variations, showing varying degrees of degeneration involving the region developed in common with the optic vesicle; (ii) deaf-mutism. Parsons and Duke-Elder (1948) state that patients with pigmentary degeneration of the retina or other members of their families are found not infrequently to suffer from insanity, epilepsy, or other signs of mental debility. Sirles and Slaughter (1943) studied twelve patients with pigmentary degeneration of the retina and found that six had nerve deafness. They state that no other extraocular pathological phenomenon so frequently accompanies this disease. Tredgold (1947) remarks that a number of cases of deaf-mutism are associated with pigmentary degeneration of the retina. Walsh (1947) gives an exhaustive list of abnormalities which may occur with pigmentary degeneration of the retina, which includes deaf-mutism, the Laurence-Moon-Biedl-Bardet syndrome (this syndrome consists of atypical pigmentary degeneration of the retina, mental retardation, obesity, hypogenitalism and often polydactyly), progressive ophthalmoplegia, dwarfism and mental retardation, and other degenerative lesions of the central nervous system.

The reason why pigmentary degeneration of the retina is sometimes associated with nerve deafness is obscure. Sirles and Slaughter (1943) suggest that the frequency of this association may be due to more than mere coincidence and that a consideration of the morphological kinship of the retina and inner ear may illuminate the problem. They quote Waldeyer's opinion that the cochlear duct and the chorioid coat are comparable, likening the pigment cells of the ear to those of the eye. It is significant that, whereas the retina develops from the neuroectoderm of the forebrain, the organ of Corti, the ampullary crest and the maculæ of the utricle and saccule develop from the neuroectoderm of the hindbrain. They conclude: "Eugenic studies have indicated the presence of a germ plasm defect

in retinitis pigmentosa. Analogy would account for simultaneous deficiency in the organ of Corti." Ewing (1930) states that when deafness is associated with pigmentary degeneration of the retina, there are defects in the development of the sensory epithelium of the labyrinth which are essentially similar to those which occur in the eyes.

It seems to me that the issue must remain in doubt in the present state of our knowledge. If the two conditions were significantly related, we should expect to find an ætiology common to both; but the real cause of the progressive degeneration of the retinal neuroepithelium which occurs in pigmentary degeneration of the retina still eludes us. Also the nerve deafness does not appear to be progressive, being present at birth and remaining much the same throughout life. Again it is doubtful whether all embryologists would agree with Sirles and Slaughter's assertion that the organ of Corti and its associated structures develop from the neuroectoderm of the hindbrain. According to Arey's (1934) account, the sensory epithelium of the internal ear is derived from the ectoderm alongside the hindbrain, and the peripheral fibres from the developing spiral ganglion arborize about the bases of these sensory epithelial cells. On the other hand, the optic cup, which is destined to provide the essential sensory epithelium of the eye, develops as an outpouching from the forebrain and the optic nerve grows back from the optic cup through its stalk to the brain. Thus, embryologically speaking, the only common feature of the development of the sensory epithelia of the internal ear and the eye is their origin from ectoderm, this being no more analogous than the development from ectoderm of the central nervous system and the skin.

Reports of Cases.

Three cases will now be described. The patients are sisters, two of whom (R.L. and E.L.) are deaf-mutes with amentia and pigmentary degeneration of the retina, and the third (S.L.) a deaf epileptic with amentia. All three were certified insane and admitted to mental hospitals. The information was obtained from the clinical records, from two of the patients (R.L. and E.L.) and from a healthy married sister.

CASE I.—R.L., a female patient, was born in 1900. As far as is known her birth was normal and she was a healthy baby, but it was soon noted that she was deaf, and she did not learn to talk like other children. At the age of six years she was sent to school, but "could not be educated". She learnt to communicate by signs. She helped in the home, but never went out to work. In 1923, at the age of twenty-three years, she was certified insane and admitted to a mental hospital. At this time she was restless, incoherent, irresponsible, resistive, noisy, violent and indifferent to food. She was considered to have congenital mental deficiency, the degree of deficiency being difficult to estimate owing to her "deafness and disinclination to talk". She did state her correct age. In three weeks she improved, becoming quiet and helpful in the ward, though depressed at times. After two years she was allowed out on leave from the hospital, but in two months returned in a state of acute depression, having tried unsuccessfully to jump off a harbour ferry. She required restraint to prevent her bumping her head against the wall. However, she quickly improved without any special treatment and was soon regarded as a trustworthy patient, clean, tidy, industrious and cheerful. She worked well as a domestic at the house of one of the hospital staff. From time to time, usually owing to some trifling frustration or annoyance, she would become sullen, depressed and agitated, removing all her clothing and banging her head against the wall; but these attacks seldom lasted more than two or three weeks. It was stated that "she needs to be left alone . . . she resents interference . . . she is sensitive because owing to her deafness she cannot understand instructions and gets upset". Failing vision was first noticed in 1940, when she was aged forty years, and an ophthalmologist reported "retinitis pigmentosa of long standing". In 1949 the report was as follows:

> Primary pigmentary degeneration of the retina. Her uncorrected vision is R.E. 6/24, L.E. 6/24. External appearance and ocular movements normal. Fundi show waxy pale discs and marked narrowing of the arteries. There is a small posterior cortical opacity on the back of each lens which is typical of the early complicating cataract which occurs in these conditions.

It was noted that she seldom noticed people approaching her from one or other side, although her central vision was quite fair. Examination of the central nervous system revealed severe nerve deafness (she could comprehend simple words shouted at three feet from each ear), but no other abnormality. The blood pressure was 138 millimetres of mercury, systolic, and 90 millimetres, diastolic. No abnormality was detected in the urine. The blood did not react to the Wassermann test. Recurrent pyelitis was the only other physical abnormality to which she was subject. It was found that she could read simple words in large print, and could print simple words in large letters with a pencil. During examination she grinned foolishly, and grimaced and gestured vigorously when attempting to speak, but she was friendly and cooperative. Her speech was a series of explosive utterances, the meaning of which could be detected with difficulty. The external genitalia were normal on superficial examination. She was of average build, her height being five feet three inches and her weight nine stone. The intelligence quotient (Terman and Merrill) was 40, and the mental age six years. The tester made the following statement: "She is good on performance and memory tests, but fails on comprehension. This is probably greatly influenced by deafness and poor vision. She can lip read. She will not express herself." In this connexion it may be noted that for the last few years she has been managing the ward clothing store very capably, a task requiring a good memory and fair intelligence.

CASE II.—E.L., a female patient, was born in 1893. Her birth and infancy were normal, but deafness was soon noticed. At the age of six years she went to a State school, but was regarded as a poor scholar and a "queer girl". By the age of fourteen years she had reached fifth class; then she left school to work in a boot factory, where for thirty years she used to wax the thread used for sewing leather. She also did a lot of fine crochet work at night. She told me, with a broad grin, that at about the age of twenty years she had a boy friend, but he went away to the war and she never saw him again. She remained single. When she was about forty years old it was noted that her vision was beginning to fail. In 1941, at the age of forty-eight years, she was given into care at the Reception House by a sister, who stated that she was deaf and partly blind, that she had always been dull and mentally backward, and that the family did not feel capable of looking after her any longer. She was certified insane. At that time she was miserable, anxious, restless, sullen and resentful. It was stated that she was dull and slow in comprehension, even when allowance was made for her deafness, childishly dependent and destructive. She said she could hear voices outside her room at night saying nasty things about her, and that everyone was against her. She was admitted to a mental hospital and soon began to improve without active treatment, so that after three months she was cheerful, well orientated, rational and a good tidy ward worker, though rather childish in behaviour, and depressed and irritable at times. In 1945 she had several epileptic fits, but otherwise her improvement was maintained. In 1947 it was noted that her vision was becoming worse. In 1949, at the age of fifty-six years (when her sister, R.L., in the same ward was being investigated), an ophthalmoscopic examination revealed advanced pigmentary degeneration of the retina, the report being as follows:

> She is the same syndrome as her sister. Her vision with and without correction is less than 6/60. The pigmentation is heavier and there are more large patches. The arteries are very attenuated and the discs waxy. She also has posterior cortical lens opacities.

Physical examination, the central nervous system and urine included, revealed no other abnormality except bilateral nerve deafness. She could distinguish shouted words at six feet. Her blood pressure was 150 millimetres of mercury, systolic, and 90 millimetres, diastolic, her height five feet five inches, her weight seven stone eight pounds. Her manner was impulsive and bizarre, and in conversation she would often grin foolishly for no apparent reason. Her speech was fair, though rather explosive in utterance, and there were minor faults in enunciation: for example, she would say "tar" instead of "car". She could read simple words in large print and write childish letters in large round handwriting. A Terman and Merrill intelligence test was not performed, but her educational attainment appeared to be that of a child of seven years, and she performed very well simple ward tasks such as making beds and cleaning. For some reason she was most antagonistic

to her sister, R.L. They never spoke to each other and slept in different dormitories.

CASE III.—S.L., a female patient, was born in 1892. Her mother said the confinement was "easy", and that she was a healthy baby, though "deaf from birth". She was sent to a private school until the age of fourteen years, but did poorly as she was dull and hard to manage. Sometimes she was very fretful and would go to bed and cry for days for no known reason. The menarche occurred at the age of fifteen years. Shortly afterwards she was in hospital with rheumatic fever and the menses ceased for six months. She then spent two years at home doing housework, after which she worked for three years in a boot factory. Her mother said she was a good worker and "well conducted" usually. However, at the age of nineteen years she suffered a fractured nose due to an angry bite by her younger sister, R.L. At the time of the injury she had a seizure, and she continued having seizures at intervals, especially at the time of her menses. She became dull, apathetic, listless and fretful, and in 1912, six months after the injury, she was certified insane and admitted to a mental hospital. At this time it was stated that she was mentally deficient, slow in speech and amnesic. Owing to her deafness she had difficulty in grasping what was going on around her. She was confused and her speech had a nasal intonation, but she was clean, tidy and amenable. Physical examination showed her to have an "adenoid facies", a high narrow palate, facial acne, pallor, exaggerated tendon reflexes and bilateral partial deafness. No visual defect was recorded. She improved rapidly, and in two weeks was bright and industrious and taking a great interest in ward affairs. She was observed in several *grand mal* epileptic seizures. In three months she was well enough to return home on leave, but two years later she was returned to the hospital, having had a series of severe seizures, during one of which she fell in the fire, suffering a moderately extensive burn of one side of the trunk. Her recovery was uneventful, and soon she was regarded as "an exceedingly nice patient and a splendid ward worker", although rather simple. She remained well, apart from occasional lapses into irritability, restlessness and depression, and no more seizures were recorded. She was allowed on leave at intervals. In 1922 she gave birth to a premature female baby, which survived eight hours. In 1929 she was returned to the hospital because of "a love affair with a male patient". At that time it was noted that she used to become depressed and tearful after her mother's visits. In 1930 she went on leave to work as a domestic in a doctor's home, but two years later she returned with severe vaginal hæmorrhage, found to be due to a miscarriage, though she vigorously denied the possibility of pregnancy. Two months later she was out on leave again; but in 1933, at the age of forty-one years, she committed suicide by drinking "Lysol". No defect of vision had been recorded.

The Family History.

The family history of these three sisters was investigated. The family lived in a Sydney suburb. The father, a labourer, was unusually quiet and solitary, but otherwise normal. He died in 1912, at the age of fifty-one years, from "natural causes". He had a sister in Australia who was deaf and mentally deficient, but all his other relatives lived in Denmark and nothing is known of them. The mother, who was not related to her husband, died in 1940 at the age of seventy-two years, from "natural causes". She had been a healthy, hard-working woman, nine years younger than her husband. She did not marry again after his death The eldest child was a normal male, who married and had normal children. He died in 1946, the cause of death being unknown. The second child was S.L. and the third E.L. The fourth child was a normal female, who married and had normal children. The fifth child was R.L. The sixth and youngest child was a normal female, who married and had normal children.

Discussion.

A consideration of these cases raises further questions of interest. In the first place, what type of inheritance, if any, is involved? The importance of heredity in the ætiology of pigmentary degeneration of the retina is undisputed. A familial incidence is common, and consanguinity of the parents is present not infrequently. Nettleship (1909) found evidence of heredity without consanguinity in 23·5% of his cases, of consanguinity without heredity in 23%, and of heredity with consanguinity in 3·4%. Knapp (1948) states that pigmentary degeneration of the retina is an abiotrophic anomaly and that in many studies hereditary transmission has been observed in at least one-half of the cases. There is much diversity of opinion regarding the type of heredity involved, but three types are described, as follows. (i) Dominant. This type is rare, is transmitted through the female and affects the sexes equally; usually the disorder develops between the ages of twenty-five and fifty years, and the affected patients pass it on to half their children. (ii) Recessive. The most common type, found mostly in consanguineous marriages. The disorder is more severe, with its onset in childhood. (iii) Sex-linked. This type is rare. Information about the family history of our patients is incomplete. It would be interesting to know whether the paternal aunt had pigmentary degeneration of the retina. However, the familial incidence of the disorder is well illustrated, and there is no evidence of consanguinity. Of interest is its limitation to the females of this family. Walsh (1947) states that this is most unusual; in two families in which he has observed it, complete details are unavailable, and other males may later show the defect. He also urges that the patients and other members of their families should be advised to abstain from procreating. It is doubtful whether such advice is justifiable in all cases.

The next question concerns the intelligence of congenital deaf-mutes. Do these unfortunates suffer from true primary amentia with deficiency of cerebral neurons, or from amentia secondary to sense-deprivation? This question is of great practical importance, for on its answer depends the educability of such children. Eichholz (1932), in a review of the mental capacity of deaf-mutes, states that some mentally normal deaf-mutes have previously been classed as mental defectives owing to the difficulty of diagnosing deafness in infancy. Also intelligence tests for deaf-mutes should be performance tests. On the basis of his review he describes 18% of deaf-mutes as "mentally backward" and 4% as "mentally defective". Tredgold (1947) states that deaf-mutism occurs in a small proportion of primary aments. Thus it appears that only a few deaf-mutes are really suffering from true primary amentia in addition to their sense-deprivation. The educability of these subjects is naturally limited. On the other hand, many deaf-mutes have normal "native" intelligence, any mental retardation from which they may be suffering being due to sense-deprivation and a neglect of adequate educational opportunity to compensate for such deprivation. As Tredgold says, in secondary amentia there is no intrinsic incapacity of the cortical neurons, and if other senses can be used to compensate for the one lost, the mental capacity may be little impaired. The present patients were all suffering from a degree of mental deficiency; but the fact that they could perform everyday manual tasks as well as most normal people suggests that, if they had had the advantage of special training and education from an early age (say two years), their mental capacity as adults might have been much nearer to normal.

The third question is closely related to the second. What is the effect of congenital deafness on the personality? Colledge (1941) has made a study of this question. He states that as the development of the mind largely depends on the acquisition of speech, and as both depend on the ability to hear, even slight deafness in childhood retards the powers of comprehension and the acquisition of normal speech. The mental life of the child is affected by his inability to think in words, to hear those directions and explanations which regulate his conduct in a world without reason, and to play freely with other children. His interests are mainly confined to what he can see. He lacks a normal means of expression of his emotions and thoughts. He probably finds other children unsympathetic, as it is difficult for a normal child or adult to understand the mental processes of the deaf. Colledge mentions an observation by Irene Ewing (1941), that fear and mental conflict are common in young and uneducated deaf children. It is difficult to calm such children when they have experienced terror in a dream. The comfort of words and the sound of a familiar voice are denied them. Colledge goes on to state that the interaction of deafness and some

incidental minor defect of personality often prevents the deaf-mute from adapting himself to the ordinary conditions of social life, and that this may result in instability of temper, petulance, aggressive and violent conduct, depression, and insanity with homicidal or suicidal tendencies. This is abundantly illustrated in the present cases. Colledge quotes some figures presented by Eichholz (1932): the incidence of insanity in deaf-mutes in England and Wales is 1 in 42; in the general population, 1 in 295. In his opinion, the high incidence of mental disorder amongst deaf-mutes is due not to deafness alone, but to its association with varying degrees of mental deficiency.

This leads on to the question whether the mental deficiency and psychological casualties among deaf-mutes can be prevented. Except in those cases associated with primary amentia, I believe that these unfortunate consequences are avoidable, and evidence to confirm this belief is not lacking. Eichholz (1932) stresses the urgent necessity of early special training and education of the deaf child by lip-reading and learning to talk, read and write. This is often successful, enabling him to enter into many normal activities, and no unusual problems of temperament need arise. He observes that deaf-mutes are happy in their own company, and feel isolated and become depressed only amongst the unsympathetic. When due to leave school at about the age of sixteen years, they are eager to face the world. At this point, however, certain dangers await them. If the novelty of their work wears off and adverse conditions of employment arise, conflicts occur which may react seriously on their attitude and behaviour. Such conflicts are exacerbated if their normal fellows are unable or unwilling to establish harmonious and sympathetic contact with them. Other advocates of early education for the deaf child are Irene and Alex Ewing (1947), some of whose admirable work has already been mentioned. Further evidence of its value is being provided by the success of special clinics for deaf children in America and England. I am indebted to Dorothy Jackson (1950) for information at this point. She has just returned to Australia after a world tour sponsored by the Carnegie Corporation of New York for the purpose of studying the work being done for the deaf, both adults and children. In the United States she saw many clinics where work with deaf children commenced at the age of three years. In Toronto, Canada, she saw three-year-old children almost totally deaf doing pre-school kindergarten work. They did little else but play, but this was of great value, as it enabled them to keep their natural voice, for a deaf infant will babble and coo just like any other. In England a few special schools admit deaf children at the age of three years; and in Manchester she saw Irene Ewing at work with children from two years upwards. This involves showing the parents how to help their child to lip-read and follow speech. Apparently even young children acquire lip-reading with comparative ease. The 1945 English *Education Act* makes provision for the education of deaf children from the age of two years.

In Australia the facilities available at present are lamentably inadequate. In New South Wales there was a move recently to incorporate the compulsory education of deaf children in the *Education Act*, but it was not gazetted owing to the lack of these facilities. However, the Department of Public Instruction has now taken over the School for the Deaf at Darlington, and this school takes deaf children from the age of six years, with an occasional five-year-old. There is also a small private day school for deaf children aged five years and over in Sydney. The only pre-school kindergarten for deaf children of which I know is in South Australia. This school takes children at the age of three years and passes them on to Education Department classes at the age of six to eight years, depending on the child's development, the degree of hearing loss, the cooperation of the parents, and the child's ability to use a hearing aid.

Good work is being done in Australia with deaf children of school age. They are graded according to the amount of hearing loss, some being considered suitable for education in a special school for the deaf, some for education in "opportunity" classes in association with children with normal hearing, and others for education in ordinary schools. This is also done in America and England, and the trend is to educate as many deaf children as possible in association with children with normal hearing.

Conclusion.

The cases reported in the present paper illustrate rather vividly what can eventually happen to deaf children in the absence of special training. In conclusion, one may ask what sort of a life our three deaf sisters might have led if they had been properly trained according to modern ideas in their pre-school and school years. The chances are that, instead of being regarded by their family and acquaintances as dull, queer and difficult to manage, and spending a life of failure and frustration in mental hospitals, they might have developed into reasonably happy, self-supporting, useful citizens, and even the added infliction of pigmentary degeneration of the retina in later life might have been borne with equanimity.

Summary.

1. The frequency of the association of primary pigmentary degeneration of the retina and congenital deaf-mutism is discussed.

2. Speculations as to the reason for this association are critically examined.

3. The cases of three sisters are described, two of whom were deaf-mutes with pigmentary degeneration of the retina and amentia. The third was a deaf epileptic with amentia.

4. The family history of these patients is reviewed and discussed in the light of our knowledge of heredity in pigmentary degeneration of the retina.

5. The intelligence of congenital deaf-mutes and the effect of deaf-mutism on the developing personality are discussed.

6. Early special training of congenital deaf-mutes and the facilities available for it are reviewed. It is suggested that, except in cases complicated by primary amentia, such training may enable many deaf-mutes to lead a reasonably normal life. Present facilities in Australia are grossly inadequate.

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References.

Arey, L. B. (1934), "Developmental Anatomy", page 464.

Colledge, L. (1942), "The British Encyclopædia of Medical Practice", "Medical Progress, 1941-2", page 52.

Dax, E. C. (1940), "Retinitis Pigmentosa", *The Quarterly Journal of Medicine*, Volume IX, page 263.

Eichholz, A. (1932), "Study of the Deaf in England and Wales", Report to the Minister of Health and President of the Board of Education, page 1.

Ewing, A. W. G. (1930), "Aphasia in Children", *Mental Welfare*, Volume II, page 1.

———, and Ewing, Irene R. (1947), "Opportunity and the Deaf Child", page 2.

Ewing, Irene R. (1941), "Psychological Aspects of Deafness", *Proceedings of the Royal Society of Medicine*, Volume XXXIV, page 315.

Jackson, Dorothy (1950), Personal communication.

Knapp, F. N. (1948), "Retinitis Pigmentosa", *Minnesota Medicine*, Volume XXXI, page 157.

Nettleship, E. (1909), "The Bowman Lectures. On Some Hereditary Diseases of the Eye", *Transactions of the Ophthalmic Society of the United Kingdom*, 1909, page 29.

Parsons, J. H., and Duke-Elder, S. (1948), "Diseases of the Eye", page 376.

Sirles, W. A., and Slaughter, H. (1943), "Pigmentary Degeneration of the Retina and Nerve Type of Deafness", *American Journal of Ophthalmology*, Volume XXVI, page 961.

Tredgold, A. F. (1947), "Mental Deficiency", page 232.

Walsh, F. B. (1947), "Clinical Neuroophthalmology", page 752.

PERSPECTIVE IN PATHOLOGY.[1]

By REGINALD WEBSTER,
Melbourne.

IN assuming, with some trepidation, the duties pertaining to the office of president of the Section of Pathology, Bacteriology, Biochemistry and Experimental Medicine in this Seventh Session of the Australasian Medical Congress, I feel with the Lord Chancellor in *Iolanthe* that:

> . . . . the compliment implied
> Inflates me with legitimate pride.

Also I feel on common ground with that characteristic figment of Gilbertian phantasy in his observation:

> But nevertheless it can't be denied
> That it has its inconvenient side.

The inconvenient side is the obligation to deliver a presidential address. I am fully conscious of the responsibility inherent in this privilege, and it will be my endeavour in discharging it to leave you with an impression that from your point of view it was not such an inconvenient phase of our proceedings after all.

When I first directed my interests and energies into the channel, not entirely free from rocks and eddies, in which they have flowed for the whole of my professional life, pathology was, to all intents and purposes, synonymous with morbid anatomy. It is true that bacteriology was already established as a separate study and examination entity, but it has been within my day and generation that chemical methods of investigation of disease have developed so rapidly, providing "fresh woods and pastures new" for many to whom test-tube dogmatism has seemed to carry a greater appeal than teaching based on the study, by dissection and microscopic examination, of the changes wrought by disease in the bodily organs and tissues. There was a period, indeed, when the post-mortem study of morbid anatomy seemed to be eclipsed by the so-described pathology of the living; but it is clear that morbid anatomy and morbid physiology should wait, each upon the other, to sustain and advance a balanced science of pathology. To long experience, confirming the ineradicable impressions of my early training, and not, I hope, to conservatism, which I have always endeavoured to resist, is to be referred my conviction that morbid anatomy has always been, and must remain, the corner stone of the edifice of clinical medicine.

The rapid and expansive developments in biochemistry, as applied to the solution of clinical problems during the past twenty-five years, have necessitated provision of a separate biochemical laboratory in every teaching hospital. Hæmatology is a somewhat later growth, of exacting quality, ranging from the elementary arithmetic of blood counts to the vertiginous genetics of the Rh factor, to which medicine, cytology and physiological chemistry have all contributed.

Clinical Pathology.

It is my purpose, on this occasion, to consider clinical pathology, as distinct from the academic pathology of a university department, although in respect to gross and microscopic morbid anatomy there should be no difference in the outlook and practice of the workers in hospital and university departments of pathology. By clinical pathology is to be understood the application of laboratory methods of all kinds to the solution of specific and frequently pressing problems relating to diagnosis, and to an increasing extent the control of treatment of disease. What, then, must be the attainments of a clinical pathologist? In terms suggested by Wordsworth one might ask: Who is this happy warrior? What is he that every man so named should wish to be? Is he to be adequately informed with respect to morbid anatomy and histology, microbiology, biochemistry and hæmatology, and proficient in the diverse techniques of these several laboratory activities? If so, he must be allowed to be "a Daniel come to judgement" of stature such as Shylock never imagined. Obviously no man can serve all these masters; but if his interests lead him to venture on clinical pathology as a specialty, he should be well versed in the practical applications of histology, microbiology, biochemistry and hæmatology—a marshal of the Four Horsemen, so to speak—and recognize that for much technical detail he will be obliged to rely on trained workers, whom it will be his function to fuse into a loyal and cooperative staff.

It has long been my conviction, asserted and maintained at every available opportunity, that a clinical pathologist is entitled to a status much above that of the exalted laboratory technician which he has often been made to feel himself, and that, competent to advise on the diagnosis and treatment of all such forms of illness as fall within his province, he should be recognized as a consultant of standing equal to that of consultants in other fields of medical practice. The scope of the specialty of clinical pathology determines the qualifications of a consultant in this field as embracing a sound clinical training, wide experience in laboratory methods, and a senior degree or post-graduate diploma in medicine.

Training of Pathologists.

To fail to recognize the early advent of a great expansion in social medicine is to lack realism and to be blind to the portents of our times. It was the declared intention of the Chifley administration to establish diagnostic units as a first step in a national health service, and simultaneously to endow every human entity in the community with a right to the benefits of laboratory facilities in radiology and pathology, conferred with the blessing of the State. In an alternative design for a national health service, sponsored by the Federal Council of the British Medical Association, "vast expansion" of the work of public health departments, with a presumed large-scale extension of laboratory work and the subsidization of radiologists and pathologists for the purpose of providing services in centres where they do not already exist, figure prominently in the foreground.

Such, then, being the shape of things to come, the demand for competent consultants in the specialty of clinical pathology may be expected to grow, and the training of pathologists looms large as a question of some urgency and no little complexity. It is a problem not of the approaching future, but of the present, and one to which the newly formed Australian Association of Clinical Pathologists might well direct its attention, and in so doing stake its claim to influence the solution.

A post-graduate curriculum for aspirants to the status of consultants in clinical pathology under the National Health Service in Great Britain was framed in January, 1947, by a committee of the Association of Clinical Pathologists in the mother country, and though formidable at first sight, the course outlined would seem on analysis to admit of no reduction. The programme of post-graduate study formulated three years ago by this committee of British pathologists of mature judgement was, like all Gaul, as described in the first sentence of the first book of Cæsar, divided into three parts—one year of post-registration clinical experience, one year in a university department, and two years in an adequately staffed and equipped department of clinical pathology. For graduates of Australian universities it is highly desirable that further knowledge and experience be pursued by a year's travel abroad. The year in a university department should be

[1] President's address, delivered at a meeting of the Section of Pathology, Bacteriology, Biochemistry and Experimental Medicine, Australasian Medical Congress (British Medical Association), Seventh Session, Brisbane, May-June, 1950.

spent early in training, and it is perhaps not essential that it be served in the department of pathology; scientific training in departments such as those of chemistry and physiology, or in the laboratories of a professorial clinical research unit, would be equally valuable. Whether the entrant to the specialty of clinical pathology makes his objective a directorship or senior staff appointment in a hospital or public health laboratory, or launches his craft on the narrowing seas of private practice in clinical pathology, it is essential that he maintain himself abreast of progress in clinical medicine and strive to retain that clinical approach to problems in disease which is all too readily lost if he is bound to a laboratory bench.

For this reason a senior medical qualification is more than desirable, and it is logical to assume that the possessor of such will be more acceptable in outlook and academic status to the body of consultants generally, in the ranks of which the efficient pathologist rightly belongs. I suggest that in an ideal state of affairs hospital pathologists and directors of diagnostic units should be provided with sufficient technical staff to ensure that they are not weighed down with bench work and that they are always available to practising clinicians for consultation. Only thus can be promoted a better direction of laboratory investigation and a reduction in the prodigious number of laboratory tests, many of which have become rule-of-thumb procedures or have no better basis than the practice of trial and error.

In advocating a minimum period of five years' post-graduate training and a senior medical qualification as conditions precedent to the recognition of consultant standing in clinical pathology, I have not been unmindful of the economic factor. Such a venture involves a heavy burden for a graduate who has already survived six years of unremunerative study, and the Sermon on the Mount notwithstanding, he must take thought for the morrow, what he shall eat, what he shall drink, wherewithal he shall be clothed. A generous system of scholarships or governments grants for the purpose of encouraging post-graduate training should be incorporated in any sound national health service, and it is gratifying to note that in the brochure outlining the national health service endorsed by the Federal Council of the British Medical Association emphasis is laid on substantial provision for medical research and the organization of post-graduate training.

Science in Medicine.

There is a widespread impression in the public mind, and it is one of which I am afraid many members of the medical profession have not entirely divested themselves, that science in medicine is inseparable from the laboratory and that clinical medicine, while largely dependent upon and profoundly modified by laboratory influence, requires not so much application of scientific method as the exercise of occult and intuitive faculties which do not admit of logical analysis and elude definition. There could be no greater fallacy. Science in medicine is a process of mind, a cultivated reasoned and critical approach to the problems of disease, and is not to be found in an impressive array of laboratory equipment or facility in the mastery of an intricate technique. The clinician who proceeds by a meticulously careful assembly of all the ascertainable facts, considers them in relation to information gained by alert observation, though it be limited by the range of his own unaided senses, and makes his reasoned and dispassionate deductions, practises the scientific method no less than the laboratory worker who studies the behaviour of cells in artificial tissue culture or is led by the occurrence of anomalous reactions in a random and fortuitous sample of blood to a long and patient investigation which may culminate in the discovery of a new blood group.

To embark on a long series of laboratory investigations without an adequate clinical history is the very negation of the scientific method. Over-zealous and particularly ill-considered requests for laboratory tests contribute largely to the snowball effect to be observed in the records of work carried out in most departments of radiology and clinical pathology and to the recurring need for expansion. All laboratory workers are conscious of this acceleration, which is only partially reflected in figures of the total number of reports issued *per annum*, as figures cannot be made to convey the relative complexity and time consumption of different procedures. I would describe as ill-considered all requisitions which are made as attempted short cuts to diagnosis, and venture to deprecate as an inferior standard of practice that in which history-taking and physical examination are regarded as irksome formalities, to be disposed of quickly in order not to impede the solution of the diagnostic problem hopefully anticipated from a sheaf of laboratory reports.

It may seem strange, and possibly presumptuous, that one such as myself, who has never been engaged in clinical practice, should emphasize the fundamental importance of history taking, but there is a special reason at this time for a recall to first principles. We are entering on a period in which developments in social medicine may be expected to include a wide extension of laboratory facilities; experience indicates that the supply will create the demand, which, as forcibly expressed by Ffrangcon Roberts (1948) in comment upon the extraordinary increase in X-ray examinations now requested, may be anticipated as accelerating towards infinity. One respect in which the lot of the consulting physician seems enviable to the isolated general practitioner is that in his view the rough places are made plain for the consultant by the X-ray and laboratory services at his disposal. He has only to press the appropriate buttons and the laboratory machine delivers him the diagnosis. As Robert Platt, professor of medicine in the University of Manchester, has emphasized in a timely essay on history taking, the experienced consultant is not so deceived. He knows how wasteful and misleading the ancillary services may prove if due care has not been given to the initial examination of the patient, and above all to the history.

Platt (1947) has recorded the results of a study which he initiated in order to determine what degree of accuracy in diagnosis was obtainable in a series of 100 consecutive hospital out-patients, selected to no greater extent than was sufficient to ensure that each presented a diagnostic problem, on the basis of the patient's history alone, apart even from physical examination. In 68 of the 100 cases an accurate diagnosis, unshaken by the results attending subsequent physical examination and laboratory investigation, was made from the data provided by the history alone. In addition to these 68 cases, the diagnosis after history taking was substantially correct in another six, while in eight cases the provisional diagnosis was correct, but physical examination and laboratory assistance contributed important findings to the final diagnosis which were unsuspected at the conclusion of history taking.

I do not suggest that diagnosis based on the facts of his illness as elicited from the patient, supplemented by information gleaned by concurrent practised observation, can ever be other than provisional, but in the interests of both patients and harassed laboratory workers I would emphasize that methodical and routine exploitation of the possibilities inherent in careful history taking will do much to ensure that subsequent laboratory procedures are well directed and effect a progressive diminution in the number of those which partake of the nature of a bow drawn at a venture.

Laboratory Tests.

Laboratory tests are of course essential to sound medical work, and circumstances arise every day in which their omission would be blameworthy. It may be doubted, however, whether many laboratory examinations, so well established in hospital routine as to have become rule-of-thumb procedures, yield results of value either to the patient or to science. Little is gained, for instance, by subjecting a child who, as judged by his clinical state and the microscopic examination of his urinary deposit, is holding his ground against an attack of acute hæmorrhagic nephritis, to venupuncture for the estimation of the blood urea content, or the multiplication of already countless observations regarding the serum proteins in this

condition. When a laboratory worker finds that in many of the cases in which he is asked to attempt the cultivation of tubercle bacilli from sputum or gastric content, no action has been taken to determine the presence or absence of reaction to the intradermal tuberculin test, he connives at slipshod work if he does not protest; inevitably also, a leaven of the defensive enters into his formerly cooperative attitude—and "a little leaven leaveneth the whole lump".

I hesitate to venture into the field of biochemistry, but the mounting burden of hospital biochemical departments was feelingly discussed by E. B. Hendry (1948) in a paper emanating from the Biochemical Laboratory of the Royal Infirmary, Edinburgh. Writing to express the biochemist's view of "Medicine as a Planned Economy", Hendry left the impression that in the established routine of hospital biochemical work there was discernible little of plan and less of economy. He directed special criticism against the fetish for estimation of the blood urea content. Over a period of twenty years blood urea determinations had formed about one-third of the total number of biochemical analyses in this laboratory. Of the first thousand reports issued in the early period of 1948 no less than 533 included blood urea estimations. The diagnoses to which the urea content of the blood was requested as relevant were of astonishing variety. Hendry expressed his opinion that a random blood urea analysis was probably the most useless, and at times the most misleading, of all laboratory examinations. His comment on the urea content of the blood as a measure of the patient's renal function was that biochemists abandoned that belief about thirty years ago. He considered the blood urea level, elevated as it is in so many and diverse pathological states, as the outstanding example of a laboratory test likely to give an abnormal result when carried out at random.

If the result of any laboratory test is to be of value to the clinician, such test must be able to detect differences smaller than those which are apparent to clinical observation. To the extent that pathologists, biochemists and their technicians are overtaxed by a multiplicity of examinations untempered by discretion, the reliability of laboratory findings must deteriorate. Some disturbing results have emerged from recent inquiry into the accuracy of routine laboratory tests. Belk and Sunderman (1947) sought and gained the cooperation of 59 laboratories in the State of Pennsylvania in a check of the accuracy of some simple and everyday procedures. All the participating laboratories were issued with solutions of glucose, sodium chloride, urea, and calcium, in concentration similar to that found in human blood; serum for the measurement of total protein, albumin, and globulin contents; and citrated whole blood for the estimation of the hæmoglobin content. All the test material was found on analysis by the referee to have remained unchanged during transit. Belk and Sunderman described the scatter of the measurements and the degree of unreliability as surprising; the accuracy of the determinations was below any reasonable standard. The unsatisfactory results outnumbered the satisfactory, and no laboratory had a perfect score.

At about the same time in England, Biggs and MacMillan (1948) assessed the accuracy of hæmatological methods commonly employed in routine laboratory work. Included were hæmoglobin estimation, red cell count and packed cell volume (errors in which vitiated the colour index, mean corpuscular volume, and mean corpuscular hæmoglobin concentration), mean cell diameter derived from the Price-Jones curve, reticulocyte count, platelet count, whole blood coagulation time, and red cell fragility. The white cell count was excluded as notorious for a large error. In the analysis of the results, furnished by doctors and technicians, notable disagreement between observers was apparent. For some of the variables the discrepancies with the mean values were large. In the red cell count there was an error of 9%, which, of course, affected the colour index and the mean corpuscular volume, measurements in which small oscillations are of interest to the clinician. Reticulocyte counts made by different observers were so wide apart that no limits of probable variation could be set, and the error in platelet counting was so large as to indicate that only conspicuous and progressive changes should be considered significant.

In most departments of routine clinical pathology the *tempo* ranges from *allegro* to *prestissimo*, the accuracy of quantitative work varying inversely as the acceleration. Such *andante* periods as occur are utilized to deal with work that has been set aside as less urgent. The situation is not easily resolved, and the appointment of additional workers has commonly proved a palliative measure, the effect of which has soon been neutralized by increased demands; further, the most sympathetic and imaginative committees of management and boards of directors are obliged to work within the limits imposed by costs attending increases in personnel and extension of accommodation. Inevitably the progress of medical science will lead to new laboratory disciplines. In recent years the emergence of the Rh factor and tests of the sensitivity of microorganisms to the several antibiotics have resulted in substantial additions to the daily round and common task, and it is inconceivable that the dynamic quality pervading medical research will not ere long be again manifest in other and equally compelling developments.

It would seem that the spreading tree of hospital laboratory routine requires some pruning and excision of dead wood, in order to render possible the efficient assumption of work deriving from advances in clinical pathology. Opinions will vary, of course, as to what is dead wood and whether the pruning saw should be applied by the laboratory staff or by clinicians. I have for a long time held decided views on the futility of much routine hæmatology, and the interminable counting of red and white cells of patients for whom a so-called complete blood examination is decreed on account of pallor. For many such patients an estimation of the hæmoglobin content of the blood is all that is required. The routine blood examination is expected to include a differential count of leucocytes, a time-absorbing and profitless procedure in the "near normals", which constitute the majority of the findings in the everyday blood examinations of hospital out-patients. In an obvious blood dyscrasia such as myeloid leuchæmia, no advantage commensurate with the time consumed can be credited to a laborious enumeration of the leucocytes to be placed in 12 or 15 different categories, the nomenclature of which is confused and confusing. A request for the quantitative estimation of the fat content of a stool may well be by-passed if a microscopic examination of a *Scharlach R* preparation indicates that fat is not in excess. Such points are no doubt matters of opinion, but if clinical pathologists were to initiate a few economies of this nature, they would probably find acceptance.

The Clinical Approach to Medicine.

Although with regard to some examinations the pathologist might legitimately exercise his discretion, in general he does not feel free to do so, recognizing that he does not see the patients and cannot fully appreciate the difficulties besetting the clinician. Hence it rests chiefly with clinicians to ensure coherence and promote economy in laboratory examinations; the means at their disposal for so doing are to be found in the omission of no detail in the history and examination of the patient and adherence to the principle that in their proper application laboratory tests should be utilized to confirm diagnoses rather than to make them.

An example of the manner in which clinical oversight led to the pursuit of a false trail, at every turn of which there arose some lengthy laboratory undertaking, was provided by the case of a girl, aged twelve years, who died in December, 1949. The patient was under observation, in and out of hospital, for a period of three and a half months; on her first appearance her mother stated that another of her daughters had died in the same hospital, ten years previously, from "kidney trouble". With a view to elucidating the nature of the presumed blood dyscrasia underlying recurrent epistaxes and anæmia, laboratory examinations from which little of clinical hæmatology was omitted were requested and carried out. Repeated red and white cell counts, hæmoglobin estimations, platelet and

reticulocyte counts on three occasions, two bone marrow biopsies, determinations of bleeding time, coagulation time and clot retraction led nowhere. Nor were X-ray examinations of the long bones and biochemical tests directed towards the serum iron content, serum proteins, serum bilirubin, plasma prothrombin, and alkaline phosphatase of any assistance. Diagnosis, which could not be deduced from 35 laboratory reports, many of which were based on very tedious examinations, was writ large in systolic and diastolic blood pressures of 170 and 90 millimetres of mercury respectively—a clinical observation which was overlooked until after the gamut of laboratory tests had been traversed. Estimation of the blood urea content forthwith resulted in a figure exceeding 600 milligrammes per 100 millilitres of blood. The autopsy disclosed very granular and undersized kidneys.

Had due significance been attached to the mother's initial statement regarding this patient's sister, and had the sister's clinical record been exhumed, it would have been found that the post-mortem notes described the kidneys as reduced in size and very granular, with adherent capsules and loss of cortico-medullary definition. Thus no doubt would have been precluded the oversight by which the hypertension escaped notice, and the laboratory staff would have been spared many exercises of which they were not particularly in need.

It is easy to understand that in busy out-patient departments the temptation to seek a royal road to diagnosis by means of laboratory tests is often very strong, and the fate in store for X-ray and laboratory workers in a national health service such as that proposed by the Chifley Government, in which demands from crowded surgeries would be presented to free-for-all diagnostic units, was not to be contemplated with any degree of equanimity. The "penny in the slot" conception and practice of laboratory tests must lead to deterioration in the standard of clinical work and to progressive atrophy of the clinical sense. I would hazard the opinion that if successive students in a clinical examination today were asked how suspicion of obstructive jaundice might be confirmed, many more would advance the Van den Bergh test, or flocculation tests combined with estimation of the serum alkaline phosphatase content, than would suggest an inspection of the stool.

The preservation of the clinical approach to medicine is the best guarantee that laboratory investigation will be rationally and economically directed. It is also highly desirable that a hospital pathologist should not be fettered to a laboratory bench, but that he should be invited to study clinical problems in the wards and to offer his suggestions as a consultant specialist in laboratory diagnosis. He should be an accessible and readily available colleague rather than a veiled oracle who issues ex-cathedra statements from the sanctum of his laboratory. It has been an age-old tradition to speak of the department of pathology, and the post-mortem room in particular, as the last court of appeal, but this is not necessarily so; even post-mortem findings are frequently inconclusive, and all laboratory determinations, adduced before or after death, should be considered as contributory to the sum of evidence, to be sifted at the clinico-pathological conference which should find a place in every hospital calendar.

References.

Belk, W. P., and Sunderman, F. W. (1947), "A Survey of the Accuracy of Chemical Analyses in Clinical Laboratories", *American Journal of Clinical Pathology*, Volume XVII, page 853.

Biggs, R., and MacMillan, R. L. (1948), "The Errors of Some Hæmatological Methods as they are used in a Routine Laboratory", *The Journal of Clinical Pathology*, Volume I, page 269; "The Errors of the Red Cell Count", *ibidem*, page 288.

Hendry, E. B. (1948), "Medicine as a Planned Economy: The Biochemist's View", *British Medical Journal*, Volume I, page 567.

Lancet, The (1947), Editorial: "Training in Clinical Pathology", Volume II, page 219.

Platt, R. (1947), "Two Essays on the Practice of Medicine", *The Lancet*, Volume II, page 305.

Roberts, F. (1948), "Where Are We Going?" *British Medical Journal*, Volume I, page 485.

Reports of Cases.

FOUR CASES OF RHEUMATOID ARTHRITIS TREATED WITH TETRAETHYL AMMONIUM CHLORIDE.

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THE perusal of a memorandum by T. H. Howell in *The Lancet* of February 4, 1950, caused me to treat four patients suffering from rheumatoid arthritis with intramuscular injections of "Etamon Chloride" (Parke, Davis). The results appear to justify publication.

Case I.

Mrs. A, aged fifty-four years, consulted me on January 4, 1950. For the last two weeks her left arm and hand had been affected by painful tense swellings at night, which were accompanied by tingling sensations; they disappeared soon after she rose. Six weeks previously her ankles had been swollen and painful for a fortnight. Her husband, an invalid with advanced podagra, had recently had an attack of melæna and been admitted to hospital. Finance was very difficult, and she had recently taken up shop work to which she was unaccustomed. The only clinical abnormality noted was some hyperæsthesia of the palms and the bases of the fingers.

I could not make a firm diagnosis and administered nicotinic acid. On January 11, she reported that the pains and swellings had disappeared in a few days; but she now had pain in the left elbow and shoulder without demonstrable abnormality. There was some swelling of the feet which appeared to be gravitational. A salicylate-iodide mixture was prescribed, with "Multi-B" tablets.

On February 2 she reported that she still had some swellings of the limbs at night. I noted: "No signs any active disease."

On March 6 there was definite rheumatoid arthritis of the wrists and hands, of mild degree. Gold treatment was started, and, at her own request, vitamin B_1 injections.

The arthritis became progressively worse, quickly involving the lower limb joints, and increasing in severity. From March 24 she was confined to her home, and by March 30 to her bed, except for bathroom privileges. The affected joints were swollen, hot and continuously painful; the usual constitutional disturbances of anorexia, pallor and general malaise were present. During this week her husband had made his escape from hospital, where he had been chafing for weeks, thereby adding to his wife's anxiety. He was still bedfast, with active arthritis and contracture of the knees. There were now two of them bedfast together, and only his mother, aged eighty-seven years and failing, to look after him.

This was a desperate domestic situation, and it was apparent that "any port" was indicated. I therefore decided to try "Etamon". On March 31 I cautiously administered two millilitres into the patient's buttock and told her to remain recumbent for two hours. On April 2 I went in to see how much worse the situation had become. I was amazed to find Mrs. A up and about, doing light housework; her manner was cheerful, her malaise was gone, and her joints were much shrunken, with sufficient mobility and easement to allow her to carry out light tasks. Her condition had been thus improved within a few hours of the injection. I gave her five millilitres of "Etamon".

She thereafter made steady progress toward recovery. Injections of five millilitres of "Etamon" were given on April 6, 12, 17 and 24. On April 12 she had become almost free of pain by day, and could sleep well with the help of ten grains of aspirin. There was still some swelling of the joints. By May 24 there were no symptoms except a little night pain and the upper limb joints were normal. She was still pale (hæmoglobin value 75%).

On May 1 she was symptom-free; atrophy of the left thigh was first noted on this day. The left knee was

noted as presenting the appearance of quiescent mild chronic arthritis. There was slight limitation of flexion. On May 5 she reported that she had had a day in town; she had no pains in the joints; the left knee was a little swollen and a little hot. On this day it had been submitted to a provocative test of several hours of tramping city streets and stores.

On May 10 she was well. The knee was not painful or hot and the other joints were normal. Her general health and colour were excellent. The injection was repeated, mainly as a parting gesture.

On June 12 I was called to attend her mother-in-law. I examined Mrs. A. Very cold weather had set in and she was suffering a good deal from fibrositic pains. There remained as evidence of her arthritic attack only the lesions of the left knee and thigh. It is not at all improbable that these conditions were present before it; they are such common attributes of her age and type that I may not have considered them worthy of note at the first consultation.

Comment.

It is not often that one has the opportunity of watching rheumatoid arthritis develop, and I cannot help wondering whether these prodromata are a not unusual feature of the disease. They appeared to be related to erythromelalgia. Unfortunately, out of consideration for my rest, the patient did not give me the opportunity of seeing the swellings when they were present.

This was a case of subacute ingravescent rheumatoid arthritis, developing under conditions of stress and dramatically relieved after an injection of tetraethyl ammonium chloride in minimal dosage; there was a return to normal activity after two more half-doses, and a return to normal health except for a quiescent (possibly antecedent) chronic arthritis in the left knee, after six weeks.

Case II.

Mrs. X, aged forty-six years, a doctor's wife, came to me on April 19, 1950, complaining of a painful swelling of the right wrist. This had appeared spontaneously three weeks before, had been relieved by aspirin and foments, and had then relapsed after a game of golf. Examination disclosed a hot white swelling of the right wrist with gross limitation of movement—a typical enough solitary rheumatoid joint. In view of the failure of aspirin and of my reluctance to make a diagnosis of rheumatoid arthritis in one of my friends, and also in view of a strong family history of gout, colchicine was prescribed and the wrist was placed in a plaster cast.

Within three days the disorder had spread acutely to the shoulders and the left wrist. The usual miseries of colchicine in full dosage were present. She was confined to bed. The plaster was removed, as it was not relieving pain and she was unhappy about it. On this day, April 22, five millilitres of "Etamon Chloride" were administered in the afternoon. Salicylate and iodide therapy was also prescribed. On April 23 her husband reported as follows: "Not much different in the morning, but by afternoon there was considerable improvement in both the joints and the general condition."

On April 26 the patient was examined by me. Her condition was now much as when she was first examined. All other joints were now normal, but the right wrist was still swollen and painful.

On April 27 the other joints became painful and began to swell again. Her husband reported to me on the evening of April 28 that the condition was again as on April 22, with swelling and pain of both wrists and both shoulders. On April 29 "Etamon" was administered about midday. By the morning of April 30 she was again quite comfortable, with some slight discomfort in the right wrist.

On May 2 she was examined again by me. Only some slight swelling in the right wrist was found. She had become pale; "Feromax" was advised.

On May 4 a friend drove her to town—not a great distance—for a "hairdo". Some soreness and swelling of the right wrist were still present. I advised her to have an injection twice a week. On May 6 her husband reported that she had had a bad day on May 5, with signs of a general relapse. He had given her an injection in the evening, and on this day the joints had not been troublesome though she had felt generally unwell.

On May 11 the patient came to my rooms. Her general condition and colour were good. She said she felt well, but depressed. The right wrist was still pale and swollen, but without heat, limitation of movement or real pain. Some weakness and discomfort were felt when she tried to use it. Physiotherapy was advised.

On May 18 the right wrist was reported as "smouldering"; she was advised to wear a strap and use it for light tasks. She was to continue taking "Feromax" and a salicylate mixture, and physiotherapy, and to have a weekly injection for two weeks more.

On June 15 the patient was reported as having made an uninterrupted recovery, and as being well and in good spirits. There was no symptom or clinical evidence of disease in the right wrist or any other joint.

Comment.

Mrs. X's husband agrees that the benefit from the injections has been pronounced. I cannot help feeling that they averted a disaster. Three times it threatened, and each time the threat disappeared after her injection. Mrs. X had the usual difficulties associated with being a doctor's wife; but she had an extra emotional stress at this time in the matter of a housing deal, whose successful completion was a matter of urgency. She also had considerable anxiety, once the condition was established, in the matter of the care of a houseful of males during her disability. A sound right wrist is essential equipment for the modern housewife.

Case III.

Mrs. Y, aged fifty years, has suffered from arthritis for about eight years. For two years her disease has been continuously active with periodic exacerbations of great severity. She has had all the recognized treatments and has had benefit only from blood transfusion. She is hypersensitive to gold, iodide and the sulphonamide drugs. She has resigned herself to wheel-chair life. Her constitutional symptoms, but not her arthritis, are kept in check by fortnightly injections of "Combex"; at least, as long as she has the "Combex" she feels physically well and does not develop toxæmia and anæmia in her relapses.

On April 1 she was given DOCA in oil and ascorbic acid, with dramatic result. She had twelve hours' complete relief from pain. But a repetition of the injection next day was disappointing, and a further repetition on the third day produced a violent relapse. Reflection suggested that her "depot" DOCA was responsible for this, so treatment was suspended for ten days. I then gave a quarter dose of DOCA with a full dose of ascorbic acid, and she had a remission for two days. We discussed this, and she agreed to continue treatment on an experimental basis in an effort to determine a maintenance dose. For a little while it seemed that we had found it, but after a few weeks it became apparent that this was impossible. We could never predict whether she would have a remission or a relapse. The treatment was therefore given up. This seems to have been a fairly typical general experience with this treatment.

Therefore, and with some diffidence, I suggested "Etamon". On May 15 she had five millilitres without effect. On May 16 I gave her ten millilitres. She reported on May 18 that she had had a very comfortable day and night, with limbs relaxed and free of all pain following the injection, but that she had relapsed next day. I repeated the injection, but was not able to get a report until three weeks later, when she was very uncertain about it, having had a severe relapse during my absence. Both injections had produced a severe headache and she was not inclined to have more, and I am not urging it.

Comment.

This case is reported for a full record of my experience of this treatment. It does not represent a failure. We actually did obtain a cortisone effect both with DOCA and ascorbic acid and with "Etamon". DOCA and ascorbic acid therapy was disappointing. I have a feeling that intensive "Etamon" therapy might do a lot for her; but I think that it would be unjustified to urge it until one had more experience and a firmer conviction.

Case IV.

Mrs. T manages a department in a local emporium. She is forty-five years of age and has suffered from rheumatoid arthritis since she was seventeen years old. She has severe deformity of her wrists and hands with maximal synovial thickening, and is subject to frequent relapse, which, however, does not stop her working. Her only emotional stress is her disease. But she is a woman of great courage and has come to terms with that enemy. She is acutely interested in cortisone, and told me that she was prepared to sell everything she had if she could get it when she went to America, and she did not care if it did turn her into a "bearded woman or a bullock". She is a woman of balance and common sense, who has adapted herself to life. Her intelligence is, I think, above average. I therefore felt justified in asking her to come and see me.

I related to her the news of the DOCA and ascorbic acid treatment, and my experience of it, and the cost. I also told her of the experiences with "Etamon", also of my initial and still present scepticism; I said that I was prepared to give her either of these treatments if she so desired, but that in either case, though hoping for results, she must expect no benefit. Of the two I recommended "Etamon" and she decided to try it. I am sure that in the preliminary discussion I effectually removed any cause for optimism, and thereby for any "functional" good result.

On May 12, 1950, she was having one of the more acute of her relapses. It had been present for two days and she could expect it to last for a week at least. I gave her five millilitres of "Etamon". On May 13 she was better, but not much; 10 millilitres of "Etamon" were given. On May 15 she was much better in herself, and quite free of pain at rest. Movements were free; there were still a little more swelling than usual and a little pain on movement. The patient agreed that this might have happened anyway, but said that in the usual course of things the attack would have lasted much longer. Ten millilitres of "Etamon" were given.

On May 18 her improvement had been maintained; 10 millilitres of "Etamon" were given.

On May 19 I left for the Australasian Medical Congress (British Medical Association) at Brisbane. On my return she reported that she had remained well for a week. Then a fresh relapse had set in, and she had "suffered the tortures of the damned" for the last week. Her finger joints and wrists were again hot, swollen, and painful at rest.

On June 6 she was given 10 millilitres of "Etamon". By the evening of June 7 she was completely relieved of her exacerbation, and by June 10 she was in her usual condition. She had an injection on that day, and on June 13 and 16. On June 17 she left on a buying trip, with a bottle of "Etamon" and a note to a friend of mine at her destination.

Comment.

The cortisone effect has been obtained twice in this case, and I am quite sure that suggestion therapy has played no part in it.

General Comment.

It is to be noted that the exacerbation which followed discontinuance of treatment in the last two cases was severe; however, this may have been seasonal. Both the patients are subject to exacerbation with the onset of winter. The seasonal break has been delayed in South Australia this year, the weather having been of Indian summer quality until about May 25. Heavy rains set in on that day and lasted some ten days to be followed by intense and sudden cold. In any case it appears that such relapses can be relieved by "Etamon" therapy.

Cases I and II were similar in that they were both "first cases", and both of recent origin, and both appeared under conditions of strain. They may therefore be fairly regarded as examples of the arthritis postulated as a disorder of adaptation, being manifestations of suprarenal fatigue. Cases III and IV are chronic cases of long standing with continuous smouldering activity and phases of acute exacerbation, not in the present instances attributable to immediate stress.

These cases and the one reported separately by Dr. J. M. Pedler have convinced me that it is possible to obtain the cortisone effect in rheumatoid arthritis with tetraethyl ammonium chloride. In the contribution mentioned at the beginning of this report, T. H. Howell stated that he had obtained long remissions of pain with tetraethyl ammonium bromide in cases of rheumatoid arthritis. I saw this article when I was studying the correspondence concerning DOCA and ascorbic acid. I read it with considerable scepticism, as I could not see any rational basis for it. But on the principle that any treatment which will not do harm is worth trying in this desperate disease, I filed it away in my mind. The time to try it came when Mrs. A was going downhill, could obviously not afford DOCA and ascorbic acid therapy (and I equally could not afford to give it to her), and something just had to be done. I am not easily surprised at the strange things that happen in medicine, but when I saw her after two days I was literally amazed. I took my problem to Dr. Donald Cheek, who is, of course, our local authority on the adaptation syndrome and the suprarenal gland, and he has produced for me the very simple—and we both feel too simple—theory of the induction of suprarenal rest by temporary sympathetic paralysis, with restoration thereby of the DOCA-cortisone balance. His explanation is actually much more abstruse, but I have reduced it to terms which simple people like myself can understand. If this theory is accepted—and basically it is probably the true one—then it is logical that rheumatoid arthritis of recent onset will readily be amenable to courses of tetraethyl ammonium chloride therapy, and that only by giving very long courses of therapy can any permanent gain be expected in the long-standing cases. In these the suprarenal mechanism must have been so thrashed through the years that it will need a long rest to recover its stability, if it ever does. However, relief can be given in the exacerbation apparently if these cases are any guide.

I regret that such scientific data as sedimentation rates, X-ray pictures and the other paraphernalia of scientific case reporting are not on exhibition. These patients were private patients, and cost and the time factor had to be considered. Purists may quibble about the classification of them as true "rheumatoids". But these things are immaterial. The essence of the report is that the cortisone effect can be obtained in rheumatoid-like conditions by the administration of tetraethyl ammonium chloride. Dr. Pedler and I believe that we should report these results without further ado. We believe that others who read Dr. Howell's note may have reacted to it in the same way as myself, and that this thing which may prove to be a valuable treatment and research tool may lapse into obscurity and be lost. Neither of us is in a position to treat a large number of patients or to carry out investigation on a proper scientific basis. We believe that we should attract the attention of those who are so situated that they can proceed with the business.

Apart from its ready availability, we believe that the treatment has advantages over DOCA and ascorbic acid and over cortisone itself. It is relatively cheap; one dose costs no more than a couple of bottles of "A.P.C." mixture; the duration of the effect is longer; it is safe for all those

who have sound arteries (although Dr. Howell seems to have considered possible unsoundness as of no moment), and there is no danger of producing "a bearded woman or a bullock".

In my mind the method beckons thought and speculation down many avenues. Sympathetic stimulation by adrenaline in oil relieves rheumatoid arthritis, presumably by flogging the tired horse; it also relieves chronic asthma. Asthma is often psychogenic and may well be an expression of failure of adaptation. May it not prove that suprarenal rest produced by tetraethyl ammonium chloride will relieve chronic asthma? The suggestion is offered for those who wish to try it.

Finally, the treatment completely failed to relieve Mr. A's gouty arthritis, and is of no value in my hands in fibrositis.

Addendum (July 6, 1950).

All three successfully treated patients have been examined this week. Mrs. X is supremely well, has moved into her new house and is playing golf. Mrs. A has had hot, swollen, stiff wrists again and was given an injection of 10 millilitres of "Etamon" on July 3; today the joints are freely movable and painless. Mrs. T suffered an acute relapse on July 1 and 2, was given an injection on July 3 and was much relieved by next day; her condition has steadily improved since, but the joints still have some abnormal swelling and limitation. A further injection was given.

A CASE OF RHEUMATOID-TYPE ARTHRITIS TREATED WITH TETRAETHYL AMMONIUM CHLORIDE.

By J. M. PEDLER,
Adelaide.

MRS. E.S., aged forty-seven years, first consulted me on January 23, 1950, complaining of swelling, pain and stiffness of both ankle joints, both knee joints and the left shoulder joint, of three weeks' duration. There had been pain of lesser degree in the wrists and elbows, and the small joints of the hands were stiff when she awoke in the mornings. The joint pains woke her at 2 a.m. and she could not go to sleep again. She had difficulty in doing her housework and could not go outside the home. She had previously had occasional mild twinges of rheumatism in the knees and wrists, but had had no serious illness otherwise. She had one child, aged seventeen years. Menstruation, appetite, digestion, micturition and bowel function were normal.

Examination showed the patient to be a short, moderately obese woman, of good colour. There were no physical defects of note other than in the joints. The left knee joint and the left shoulder joint were moderately enlarged, with much periarticular swelling and pain on movement. In the right knee and right ankle the same changes were seen in lesser degree. Examination of the wrists, elbows and small joints of the hands revealed no abnormality.

A "high protein" diet, full dosage of salicylate as "Enterosalyl", the application of heat to the affected joints and bed rest for one week were prescribed. Some relief was obtained, but her troubles all recurred as soon as she resumed activity. Salicylate therapy was continued for three months. Relief at the end of this time was practically nil.

On April 28 I gave her an intramuscular injection of five millilitres of "Etamon Chloride" into her right buttock. This had no effect at all on her joints. Next day I gave her 10 millilitres, five millilitres into each buttock. By the next day she had had considerable relief of pain and stiffness and was able to move about the house freely, whereas formerly she had "shuffled about like a cripple". She had a further injection of 10 millilitres on May 2 and injections twice a week thereafter until June 6. During that time she lost practically all her pain and stiffness and the joint swellings subsided. She was able to resume all her household duties. She did the washing and went to town for the day—two things she had not done for months. She slept well and did not wake with pain in the night.

She has had no further rheumatic symptoms since her injections were stopped four weeks ago despite extremely cold wet weather. How long she will remain free from joint pains is problematical; but I believe that, if at any time her symptoms recur, they will be quickly and effectually relieved by further injections of "Etamon".

APPARENT RELIEF OF TRIGEMINAL NEURALGIA WITH ELECTRIC CONVULSION THERAPY: REPORT OF A CASE.

By A. S. ELLIS, D.P.M.,
Consultant Psychiatrist, Cairns and Townsville Hospitals, Queensland.

ELECTRIC CONVULSION THERAPY is so easily applied that there is a tendency to use it for some conditions in which it is not, strictly speaking, indicated. It was with some misgiving, therefore, that this treatment was advised for a patient suffering from trigeminal neuralgia. The decision to advise it was taken on the basis of reports of three cases published by Janjigian (1949). Janjigian gave electric convulsion therapy for profound depression occurring in three cases of *tic douloureux*, and found that after one or two treatments the pain disappeared. His case reports were written from eighteen months to two years after the treatment, and on follow-up examination the patients reported complete freedom from pain during the interval.

Clinical Record.

A married woman, aged fifty-one years, was referred to me in January, 1949. Her complaint was of pain under the left side of the tongue and of some sensitivity of the red margin on the left side of the lower lip. Severe pain in the distribution of the left mandibular branch of the fifth cranial nerve was precipitated by eating, by touching the left side of the lower lip, or by a cold wind. The patient looked ill and had lost weight because she was frightened to eat lest she precipitate the pain. The condition had been present intermittently for three years and had become increasingly severe and frequent in the past twelve months. She had had her teeth radiologically examined and all the top teeth and the lower premolars on both sides had been removed, without effect on the pain. Trichlorethylene inhalations had not been given.

A diagnosis of trigeminal neuralgia was made and an analgesic mixture was given. She was referred to a surgeon in the hope that injection or root resection might give relief.

She was not heard of again until December, 1949 (eleven months later), when she was again referred to me, this time by another medical man. During the interval she had had four mandibular nerve injections. The first of these gave relief for eleven weeks, the others were not effective, and plans were being made to refer her to a neurosurgeon.

On the basis of the case reports mentioned earlier, electric convulsion therapy was advised, and treatment was given in the routine way. She received treatments of 120 volts for 0·3 second on December 30, 1949, and on January 2 and 4, 1950.

She reported that after the second treatment the severe pain in the face had disappeared, although she still had an occasional twinge in the side of the tongue.

On February 14, six weeks after treatment, she reported that she had had no severe pain in the interval. She was able to eat well, had gained a stone in weight, and appeared healthy and happy.

Early in March she reported one "relatively mild" attack, which lasted only a few hours. She had also had occasional

spasms of severe pain in the lip. These lasted only a few seconds, the side of the mouth went "stiff" and saliva dripped from the mouth.

On May 8, over four months after treatment, she reported no pain at all in the jaw and complete freedom from the painful spasms of the lip for the past six weeks. She said that if she went out at night the cold air "used to affect it a bit", but she guards against this by wrapping a scarf around the head and the side of the face. She is able to eat well and has gained another seven pounds in weight since February.

Comment.

One interesting feature is the apparent dissociation of the "trigger-zone" component from the deep pain component of the condition. It might be hazarded that stimulation of the receptors in the trigger-zone area acted as the starting point of a conditioned reflex and that the treatment acted by in some way "splitting" the reflex into its components. A good deal (of little value) might also be said about the apparent "physiological leucotomy" brought about by the electric current.

If the relief should be permanent—as seems likely in Janjigian's series—it opens a field of speculation as to the nature of the psychological component in patients suffering from this condition. In this particular case the patient had been in good health both physically and mentally all her life. She was reasonably happily married, but had no children. The condition began shortly after she came to Townsville, but in the absence of deeper psychological investigation this was the only possible determinant noted.

Detailed personality investigations were not carried out, but one could say that the patient was inclined to "dominate through illness" and was of a rather rigid personality type. The body build was of the pyknic type.

Complete cure is not claimed, but the case has been reported early in the hope that others with more opportunity for obtaining clinical material may be stimulated to try this method for relief of pain in this condition before advising surgical measures. Even four or five months' relief is gratefully accepted by these patients.

Acknowledgement.

My thanks are due to Dr. K. K. Dorney, superintendent of Townsville Hospital, for permission to publish this case and for encouragement to give the treatment; and to Dr. K. King, the senior medical officer, who gave the final treatment in my absence.

Reference.

Janjigian, E. R. (1949), "Report of Three Cases of Trigeminal Neuralgia Apparently Cured by Electroshock Therapy", *The American Journal of Psychiatry*, August, page 143.

Reviews.

PERIMETRY.

TRAQUAIR'S "An Introduction to Clinical Perimetry" in the sixth edition[1] differs but little from that of 1946; indeed all later editions have not changed in essentials from the first presentation of the monograph in April, 1927. In a way this is well. Clinical perimetry then, as now, is the Cinderella of ophthalmic practice, and only gradually is the idea being accepted that perimetry with the short radius perimeter is but an introduction to the subject, and that it is essential with almost all field investigations that resort be made to the two-metre screen with test objects even as small as one millimetre. There are three important factors that determine the spatial extent of the monocular field. First is the angle subtended by the test object, that is, the size of the test object in contrast with the radius of the apparatus. With the perimeter of short radius this may be 3/330, 5/330, 10/330 and so forth; with the Bjerrum screen at two metres, 1/2000 up to 200/2000. Traquair called the analysis with white test objects "quantitative" perimetry, and if coloured test objects were used the examination became "qualitative" perimetry.

But, in clinical practice, it has become more and more evident that field work with colours, the qualitative perimetry of Traquair, is unreliable and unpractical. Therefore, the clinician today remembers an important dictum of Ferree and Rand, workers at Baltimore in the twenties, and this is the second important factor determining the extent of the visual field, "the ratio of the whiteness of the test object to the blackness of the background". So examination technique demands very white test objects and a screen of thorough blackness. Traquair has never stressed this point, and perhaps this is as well, or his work might have savoured of the physical laboratory rather than of the consultation room.

Even in his sixth edition there is little reference to the third important factor that conditions the breadth of the field, this being the amount of light in measured foot candles that falls on the test object, a very important consideration when the light sense may be affected as in glaucoma or *retinitis pigmentosa*. Rather than being a matter for criticism, Traquair's omission of reference to the photo-electric cell displays the restraint of mature wisdom. The book today, 1950, remains a great ophthalmic classic of this century, and it is good that his manual on the measure of the visual field has not become too prolix or too scientific in later editions.

[1] "An Introduction to Clinical Perimetry", by H. M. Traquair, M.D., F.R.C.S. (Edinburgh), with a foreword by Norman M. Dott, M.B., Ch.B., F.R.C.S. (Edinburgh); Sixth Edition revised and enlarged; 1949. London: Henry Kimpton. 10″ × 7¼″, pp. 352, with 257 illustrations. Price: 42s.

MARRIAGE CRISIS.

A SMALL BOOK by David R. Mace starts with a brief account of the origin of marriage counselling and leads on to a frank discussion of the present acute crisis: the instability of marriage as shown by the sharp rise in the divorce rate must be a matter of concern to all.[1] One may observe a tendency to over-simplification of the problems, here and there, but allowance must be made for the limited space. Dr. Mace is to be congratulated for the lucidity and straightforwardness of his reasoning; he writes for the ordinary man and woman, and in his suggestions never sidesteps the issue, nor does he indulge in "other-worldliness". The authoritarian ecclesiastic may, no doubt, object to some conclusions as to the necessity for divorce in certain special cases. The chapter headed "What's the Use of Religion?" deals in a very practical way with the conflict between the instinctual impulses and the spiritual aspirations of the human being. Of great interest is the discussion of the economic causes of unhappy marriage. He discusses the "double standard" of our forefathers, and the emancipation of women, together with the so-called equality of the sexes demanded at present, relating them to the existing economic conditions. The book should prove to be useful.

INJURIES OF THE BRAIN AND SPINAL CORD.

OWING to their increasing frequency, following the phenomenal increase in the uses and numbers of motor vehicles on the roads, injuries of the skull, brain, spinal column and cord are assuming greater and greater importance. Thus, the third edition of "Injuries of the Brain, Spinal Cord and Their Coverings", edited by Samuel Brock,[2] will be welcomed, especially by those engaged in industrial medicine, accident and workers' compensation insurance, compensation commissioners, judges and lawyers, because it deals with the neurosurgical, neuropsychiatrical and medico-legal aspects of these injuries and their sequelæ. The chief advances in the management of these subjects, since the second edition, have come from observations made and treatments carried out in large series of cases encountered during World War II, and fully justify this new edition, which has been revised and enlarged to 26 chapters, by 28 different authors.

[1] "Marriage Crisis", by David R. Mace; 1948. London: Delisle. 8½″ × 5½″, pp. 142. Price: 7s. 6d.

[2] "Injuries of the Brain and Spinal Cord and Their Coverings: Neuro-Psychiatric, Surgical, and Medico-Legal Aspects", edited by Samuel Brock; Third Edition; 1949. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9″ × 6¼″, pp. 804, with 125 illustrations. Price: £5 7s. 6d.

In a composite book of this nature there is usually some overlapping and repetition, but by careful editing it has been kept to a minimum; and the various authors have collaborated well.

The book opens with a chapter on general considerations of head and spine injuries by the editor-in-chief, in which is given an excellent summary of the points dealt with in more detail in succeeding chapters. Many figures and statistics concerning types and varieties of injuries and their prognosis are also presented.

Following a chapter on pathology of brain injuries, mainly microscopic, comes one by Jefferson Browder on fracture of the skull and the complications which may follow compound fractures, such as osteomyelitis, epidural and subdural abscess and septic thrombophlebitis. This section of the book is rather "dry", as it is devoid of illustrations and of characteristic skiagrams for which the reader has to wait until the special chapter devoted to radiology is reached, half-way through the book. However, most of the principles of treatment advocated are sound, although it is difficult to support his reasons for not operating upon comminuted depressed fractures which overly the sagittal and transverse sinuses and for merely performing subtemporal decompressions.

Cerebral concussion and contusions and their sequelæ are dealt with by Sir Charles Symonds in a rather too involved and lengthy fashion, with much repetition of pathology and effects, and too much quoting of other writers' opinions. The portions of the chapter concerned with clinical features and management are well done; the rest could be omitted.

Injuries to cranial nerves and the optic chiasm are discussed briefly and simply by another English neurologist, Ritchie Russell. He describes injury of the last four cranial nerves as "Collet's syndrome", but Osler refers to this lesion as "Hughlings Jackson's syndrome".

Massive intracerebral hæmorrhage is a condition which has been recognized only in recent years, and it receives concise, yet adequate, consideration by Friedman, but delayed intracerebral hæmorrhage might be better designated by the more familiar term *"Spät-apoplexie"* actually used by Bollinger in 1891.

The chapter on extradural hæmatoma, subdural hæmatoma, subdural hygroma and cephalhæmatoma has been written by the late Max Peet, better known for his pioneering work on the surgical treatment of hypertension. Coming from such a well-known neurosurgeon, it is a disappointing contribution and needs to be brought up to date.

Post-traumatic brain abscesses are ably described by Francis Grant.

Gunshot wounds of the brain and their complications, including rhinorrhœa and pneumocephalus, are very fully dealt with by Davidoff and Feiring, and the chapter is one of the best in the book.

Cerebral birth injuries are well classified and their late results are described by Alpers; but there is too much repetition and confusion, especially regarding statistics of morbidity rates which are really not necessary.

In the next chapter, on post-traumatic convulsive and allied states, Elvidge, of the Montreal Neurological Institute, also gives far too many extensive and confusing statistics concerning incidence rates for various sites of brain damage.

As previously mentioned, two chapters are devoted to neuroses following head and brain injuries. In the earlier chapter, the late Paul Schilder goes carefully into their classification into four chief types, which are illustrated with case histories. But in the second and more modern chapter, there is too much vague description of the mechanisms whereby neuroses are produced, and their relationship to the patient's "ego". However, psychotic states following head and brain injuries in both adults and children are very clearly and dogmatically described.

The chapter on simulation (malingering) in relation to injury of the head and spine contains many useful references and many tests and procedures which should be of assistance in differentiating this state of affairs from pure hysteria.

The portion of the book which deals with head injuries concludes with an excellent chapter on the radiological aspects of fractures of the skull and injuries of the brain written by Dyke, and revised in this edition by Davidoff.

After a long and redundant article on pathological considerations in injuries of the spinal cord, there follows a short but very pointed chapter by Bronson Crothers on birth injuries of the spinal cord.

Injuries of the vertebral column and spinal cord are discussed by John Scarff in great detail in the longest chapter in the book.

Herniation and protrusion of intervertebral disk tissue are equally discussed in a very thorough manner by Echlin in a new chapter, which includes cervical as well as the better recognized lumbo-sacral lesions.

The effects of electric shock on the nervous system are briefly discussed by Hyslop, and the more important technical points are explained in relation to their clinical application.

Caisson disease and cerebral fat and air embolism are also briefly dealt with by Hare with a plea for their earlier recognition by keeping these conditions in mind when unusual complications appear after injuries.

The chapter from a combined doctor and lawyer, Moses Keschner, on the medico-legal aspects of injuries of the brain and spinal cord and their coverings supplies a long-felt want for doctors who become involved in these matters.

The book concludes with a consideration of the electroencephalogram in cases of head injury.

The general setting up of the book has been well carried out, and there are only very few misprints. There is a very complete bibliography given at the end of each chapter with full references. It is a book not for students or young graduates, but, as indicated in the preface, for those specializing in industrial insurance, compensation and medico-legal matters and for reference purposes.

THE URINARY FUNCTION OF THE KIDNEY.

THIRTEEN YEARS have passed since Homer Smith published his now classical work on the physiology of the kidney. In that time Smith's clearance techniques have been thoroughly assimilated and exploited and have added greatly to our understanding of renal hæmodynamics. But it has become increasingly evident that, however much we know of renal blood flow, glomerular filtration rate and tubular maxima, we can never completely appreciate renal function without taking into account such factors as regulation of body and urine volume and ionic balance. Wolf emphasizes this by using the title "The Urinary Function of the Kidney"[1] in the hope that emphasis on this aspect of renal function will help to stimulate thinking. In this he has succeeded, and though one finds unconvincing his arguments on the validity of Smith's postulates for a substance whose clearance will measure glomerular filtration rate, it is proper to question them, for it has never been claimed that they are axioms and an enormous superstructure of deduction has been built on them, particularly by clinical research workers, without consideration of their possible deficiencies. As Whitehead remarked: "It is with the first chapter that I always have the greatest difficulty." But the reader will find Dr. Wolf orthodox in most of his views and critical only of what deserves to be criticized.

The book is written primarily for physiologists and research workers, but in these days when function is becoming more and more important to the clinician it will find a larger public. In the chapters on water metabolism, electrolyte balance and renal regulations particularly there is much of great clinical interest. It is unfortunate, however, that the work on the artificial kidney from the Brigham group appeared too late to be mentioned. The final chapter on the "Endocrines in Urinary Function" contains much recent work which is sure to be the precursor of a great deal more. Perhaps the most valuable part of the book is the bibliography: practically every statement of fact is fully documented. The book can be recommended with confidence.

WILLIAM WITHERING OF FOXGLOVE FAME.

IN 1785, when Dr. William Withering gave his "An Account of the Foxglove" to the scientific world, he thereby earned for himself undying fame; it contained a convincing argument for the safe use of a new specific remedy that would bring certain relief to patients suffering from the dropsy. Now we have a full account of the life and work of this provincial doctor who was able to make one of the few contributions of any value to the London Pharma-

[1] "The Urinary Function of the Kidney", by A. V. Wolf, Ph.D.; 1950. New York: Grune and Stratton, Incorporated. 9" × 6", pp. 378, with 49 illustrations. Price: $7.50.

copœia; and it is written by T. Whitmore Peck, M.P.S., and Dr. K. Douglas Wilkinson, who have made a thorough investigation of the family connexions, scientific, professional and private activities, as well as outside events more or less related to the subject.[1] At any rate interest is fully maintained when it comes to the new therapeutic discovery and frequent glimpses are obtained of medical practice of the day, just as the modern scientific era was about to come into full bloom.

Dr. William Withering was indeed a shining example of the cultured physician of his time, who perhaps found medical work sadly lacking in effective weapons against disease, and medical theory wanting in the sort of accurate knowledge that was beginning to be so characteristic of the fundamental sciences. He found time, therefore, for the study of natural philosophy and for the writing of books on his special branch of knowledge—field botany. Hence his interest in the foxglove and in its empirical administration to patients with dropsy. His experience had shown him that excessive doses of the preparation might cause alarming symptoms, so he proceeded to lay down rules for safe dosage, devised ways and means for extracting the active principle from the leaves of the plant, and observed that one of its effects on the system was to promote diuresis. In a number of instances the timely exhibition of his infusion saved distressed patients from an early grave and brought a wonderful relief from the symptoms caused by a spreading œdema; but it is extremely doubtful whether Dr. Withering knew anything of the action of digitalis upon the heart.

There are times when the thread of the main theme seems to wander into inconsequential highways and byways only vaguely connected with the subject, and for that reason the book lacks something that might help to classify it as a work of art, even though it must be looked upon as a very complete biography. There are many illustrations, some of which are interesting; and those already seized with the romance and glamour of this constructive period in our history will be well advised to read the book.

THE CYTOLOGICAL DIAGNOSIS OF CANCER.

A BOOK entitled "The Cytologic Diagnosis of Cancer" has been written by the technical staff of the Vincent Memorial Hospital Laboratory, which was opened in 1942 in Boston.[2] The Vincent Memorial Hospital, which would eventually provide a gynæcological service affiliated with the Massachusetts General Hospital, was not to be built until the end of World War II. For the time being, therefore, the laboratory staff was free to concentrate on a research problem, and one, moreover, that could be carried out in limited quarters. In 1941 Dr. Papanicolaou had published his first clinical paper on the diagnosis of cancer by means of the vaginal smear. This suggested an avenue of work for the staff of the newly opened Vincent Memorial Laboratory. Their book is the result of six years' work in this field. At the end of the war the work was expanded to include the cytological diagnosis of cancer in other parts of the body. In a foreword Dr. J. V. Meigs and Dr. Maurice Fremont Smith commend the work of the laboratory staff, which consists of a group of women technicians under the leadership of Ruth M. Graham. According to the foreword, these technicians developed a high degree of skill and their diagnoses were accepted by the whole hospital staff. Their book is certainly a clear and beautiful presentation of the subject. It includes descriptions and illustrations of normal and carcinomatous cells from the female genital tract, from the respiratory tract, from the gastric mucosa, from the genito-urinary tract and from pleural and peritoneal fluids. A histological section of each tissue is shown, followed by photomicrographs at low and high magnification, of desquamated cells, and a coloured drawing of the high-power field illustrated. A line drawing supplies a key and a full description of each cell is given. Difficulties in interpretation are discussed. It was found impossible to include the many borderline cells that appear in smears, but the illustrations should provide very useful standards for other workers. Much of this work is still in the research stage; it is obvious that a long training in cytological methods is required before anything like reasonable accuracy can be obtained. This method of diagnosis will always have its limitations, even in the most experienced hands. Exfoliated cells are dead cells; they have undergone degenerative changes and their behaviour and reaction to normal surrounding tissues are not apparent. It is by their behaviour, at least as much as by their appearance, that those anarchists, the cancer cells, must be detected. This book provides much useful information about the appearance of exfoliated cells, and it has been most carefully prepared and beautifully produced. The illustrations are excellent, and a well-written chapter on technique describes how the beautiful preparations shown here were made.

A HANDBOOK OF OSTEOLOGY.

"OSTEOLOGY FOR DISSECTORS" is a tutorial handbook by Robert King Howat for "use in the dissecting room as well as at home".[1] Its intention is to provide an aid to the "learning, understanding and remembering of anatomical facts", and the author notes that the long-standing repetition of osteology as a dry subject is due to the studying of the bones "in isolation".

This book is of an unusual type, and the author apparently is a student of psychology, as he states that the notes will be useful "to that type of mind that finds a numerical presentation of facts helpful to the recognition of structures in the living body and their clinical applications, and to the value of a repetition in impressing the memory".

The book, although termed "Osteology", contains much useful information on arthrology and myology, and it is pleasing to note that the functional aspect of these subjects is not neglected.

There are some interesting points that differ somewhat from current teaching; for example, the author states that " . . . the popliteus muscle is not a flexor of the knee as was stated years ago by Fürst, and is shown by two simple tests. The distance between its ends is less in extension than flexion, strong traction on its tendon causes not flexion but slight extension movement".

While one cannot agree that this is a book for reading in the home, if used in the dissecting room as the author recommends, and particularly if there is opportunity close to the dissecting room for the study of various parts in the living, the book can be recommended as one which medical students and post-graduates, too, will find most useful in their study of anatomy.

THE HEALTH SERVICES IN BRITAIN.

THE dedication of Dr. S. Leff's book, "The Health of the People", is "to those among the healthy who are striving to improve the conditions of the treatment of the sick"; it could profitably be read by every member of the community with any pretence to social conscience.[2] The book is a widely documented and detailed survey of the birth and development of the public health services in Britain, from the sixteenth century to the present day. It is divided into two parts—an historical survey and a detailed account of the present health services.

Were it not for the author's healthily sincere and constructive attitude, this book would read like a chronicle of human futility. At all times the relief of misery intended by enlightened legislation or by the devotion of reformers has been incompletely achieved because of political considerations, self-interest, indifference and stupidity. The author in his historical survey traces the effects of such out-

[1] "William Withering of Birmingham, M.D., F.R.S., F.L.S.", by T. Whitmore Peck, M.P.S., and K. Douglas Wilkinson, O.B.E., M.D. (Birmingham), F.R.C.P. (London); 1950. Bristol: John Wright and Sons, Limited. London: Simpkin Marshall, Limited. 8¾" × 5½", pp. 256, with many illustrations. Price: 21s.

[2] "The Cytologic Diagnosis of Cancer", by the Staff of the Vincent Memorial Laboratory of the Vincent Memorial Hospital; a Gynecologic Service Affiliated with the Massachusetts General Hospital, Boston, Massachusetts; the Department of Gynecology, Harvard Medical School; Published under the Sponsorship of the American Cancer Society; 1950. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9¾" × 6¼", pp. 244, with 153 illustrations, some of them coloured. Price: 61s. 9d.

[1] "Osteology for Dissectors: A Tutorial Pocketbook", by Robert King Howat, M.B., C.M. (Glasgow), F.R.C.S. (England), F.R.F.P. and S. (Glasgow); 1950. London: Henry Kimpton. 7" × 5", pp. 292, with 46 illustrations. Price: 15s.

[2] "The Health of the People", by S. Leff, M.D., D.P.H.; 1950. London: Victor Gollancz, Limited. 7¾" × 5", pp. 288. Price: 12s. 6d.

standing events as the Great Plague of London and the Industrial Revolution on the growth of the health services. He shows how the drastic lessons learnt perforce when the outbreak of war has sharply revealed the unsatisfactory physical standards of the population as a whole are rapidly forgotten when the danger has been overcome; what is even worse, reforms instituted to remedy the defects have been known to be undone later. It is noteworthy that in this book no dogmatic statement is made for which some reliable authority is not quoted, usually the report of a committee of inquiry or similar body. Certainly much has been achieved; but compared with what remains to be done, it has been but as a drop in the ocean. Even now the dreadful "Poor Law" atmosphere is felt in some institutions caring for destitute persons of all ages; this atmosphere owes its origin to the earlier belief that poverty and illness are always the fault of the persons afflicted, and that therefore the relief given must be seasoned with disapproval, and not too generous. A further unhappy observation is the fact that such organizations of medical practitioners as the Royal College of Physicians and the British Medical Association have not always followed a completely altruistic path.

It is impossible in this place to do more than mention some of the subjects discussed in this book. Part I, as was previously mentioned, is an historical survey. In Part II the author presents a detailed account of the present health legislation; he discusses each aspect of it critically, and suggests for each a short-term and a long-term policy to overcome existing deficiencies, so that the true objects of the legislation may come nearer fulfilment. In the author's opinion the *Health Act*, although many of its measures were very progressive, was a series of compromises, and the Government made the mistake of not relying on its main support and ally, the people, to combat the resistance of reactionaries. He believes that the major struggles for a real health service for the nation are yet to come, and that if the people were made to understand the principles involved and the forces to be overcome, they would soon join in the battle for health. "Victory for a real health service for the nation will only be achieved when *the health of the people becomes the concern of the people.*"

Though conditions in Australia are not comparable with conditions in Britain, this book could well be read by all in this country who give a thought to the well-being of the less fortunately placed among us. Perhaps we also have some lessons to learn.

NURSING PSYCHIATRY.

THAT a second edition of a "Handbook of Psychiatry for Students and Nurses" by Louis Minski[1] has appeared so soon after the first is evidence that this little book provides adequately what it sets out to provide—a short, concise book "presented in a somewhat concentrated form".

The book closely follows the first edition along orthodox lines. Concentration of the subject matter has of necessity led to over-simplification, but for the student the chapters dealing with ætiology and symptomatology, and those descriptive of the various mental illnesses, remain an admirable medium for revision. The chapters dealing with specialized forms of treatment are excellent, and include convulsive therapy, electronarcosis, carbon dioxide inhalation and prefrontal leucotomy. The author is wisely cautious in his evaluation of the last form of therapy, but he stresses its value in the deteriorated schizophrenic who presents behaviour problems. Concluding chapters on psychotherapy and occupational therapy are brief and provide little more than a description of the scope of these therapies.

"An Introduction to Psychiatric Nursing" by Marion E. Kalkman[2] is a much more voluminous book, written obviously by one who has had personal experience of the problems that confront the psychiatric nurse. The book is a challenge to those responsible for the training of nurses in a mental hospital, as it obviously demands a much greater understanding of personality structure, mental mechanisms and the development of mental symptoms than has generally been considered necessary in the more materialistic approach to which psychiatric nurses are accustomed.

The approach is intensely practical and humane, and the book is original, if not unique, in its constant insistence on the value of the nurse's emotional reactions to her patients, and on the fact that it is necessary to consider the reaction of the individual patient to the most commonplace of nursing procedures.

The book is divided into five parts. The first two deal with observation and understanding of the patient, the third with methods of treatment, the fourth with the actual working problems of the psychiatric nurse, and the last with the nursing care of certain types of patients.

This is the type of book that should be read by a psychiatric nurse during her first month in hospital—and annually afterwards to assist her in retaining a humane understanding of her patients. It would be read with advantage also by all those who have to care in any way for psychotic patients.

[1] "A Practical Handbook of Psychiatry for Students and Nurses", by Louis Minski, M.D., F.R.C.P., D.P.M.; Second Edition; 1950. London: William Heinemann (Medical Books), Limited. 7¼" × 5", pp. 148. Price: 6s.

[2] "Introduction to Psychiatric Nursing", by Marion E. Kalkman, R.N.; 1950. New York, Toronto and London: McGraw-Hill Book Company, Incorporated. 9" × 6", pp. 356, with 13 illustrations. Price: $3.75.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Medical Annual: A Year Book of Treatment and Practitioner's Index", edited by Sir Henry Tidy, K.B.E., M.A., M.D. (Oxon.), F.R.C.P., and A. Rendle Short, M.D., B.S., B.Sc., F.R.C.S.; 1950. Bristol: John Wright and Sons, Limited. London: Simpkin Marshall, Limited. 8¼" × 5½", pp. 548, with illustrations, some of them coloured.

A standard work on medical progress, now in its sixty-eighth year.

"The Cancer Patient: A New Chemotherapy in Advanced Cases", by B. A. Meyer, M.B., Ch.B. (Ed.), L.R.C.S. and P. (Ed. and Glas.), and I. S. Orgel, M.D. (Dublin); 1950. London: J. and A. Churchill, Limited. 7¼" × 4½", pp. 96. Price: 7s. 6d.

The authors claim to have obtained from canker-bearing trees a substance which has the power to ease the pain of cancer without dulling the mind and to exert an effect on the malignant process itself.

"Problems of Infancy and Childhood", edited by M. J. E. Senn, M.D.; 1949. New York: Josiah Macy, Jr., Foundation. 9" × 6", pp. 162. Price: $1.25.

Transactions of the third conference on this subject held in March, 1949.

"Factors Regulating Blood Pressure", edited by B. W. Zweifach and Ephraim Shorr; 1949. New York: Josiah Macy, Jr., Foundation. 9" × 6", pp. 280, with some illustrations. Price: $2.55.

The transactions of the third conference on this subject held in May, 1949.

"Cytology of the Human Vagina", by Inés L. C. De Allende, M.D., and Oscar Orías, M.D., with a foreword by Bernardo A. Houssay, M.D., and translated from the Spanish by George W. Corner, M.D.; 1950. New York: Paul B. Hoeber, Incorporated. 9½" × 6", pp. 316, with many illustrations, some of them coloured. Price: $7.50.

" . . . not only a manual of the vaginal smear technique and a report of investigations, but also almost a textbook of human female reproductive endocrinology."

"Williams Obstetrics", by Nicholson J. Eastman; Tenth Edition; 1950. New York: Appleton-Century-Crofts, Incorporated. 9½" × 6½", pp. 1190, with 651 illustrations, some of them coloured.

A text-book of obstetrics for medical students and practitioners, completely revised and substantially rewritten.

The Medical Journal of Australia

SATURDAY, DECEMBER 9, 1950.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: surname of author, initials of author, year, full title of article, name of journal without abbreviation, volume, number of first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

HUMAN ADAPTATION TO SEMI-STARVATION.

THE response of the living organism to environmental change so impressed Herbert Spencer that he made this a proximate definition of life. Claude Bernard drew attention to the function of what is illogically called in English translation "the internal environment" in mitigating the impact of external and hostile stresses on the cellular machinery of the body. The study of how the human body reacts to low concentrations of oxygen and to alterations in gravity has become urgently necessary following the rapidly increasing vogue of air travel. The adjustment of white races to tropical climates presents a problem which in Australia, more than in any other country, allows opportunities for investigation, and excellent work on this subject has emanated from the Townsville Institute in its early days and later from the University of Queensland in Brisbane. Canada at present is actively engaged on the study of low winter temperatures on life in general, not forgetting the mystery of the mosquito, which can become a plague in summer, though how and in what form it survives the fierce cold of the arctic tundra has not been elucidated. Adaptation to anæmia, pregnancy and low calcium intake has in each case been investigated with considerable attention to detail. The latest inquiry conducted with complete scientific thoroughness concerns the adaptation of the human body to semi-starvation. It might be thought that the material for such investigation has been only too abundant in camps for prisoners of war under German and Japanese control; but though the descriptions and memories have been extremely vivid there has been lacking the laboratory analysis which the problem really demands. Such precise scrutiny has been supplied by the Minnesota Laboratory of Physiological Hygiene, and recorded by H. L. Taylor and A. Keys.[1]

Thirty-two conscientious objectors were kept for a year under investigation; for the first three months the diet was liberal, namely, 3492 Calories for each man per day; then came six months at 1570 Calories daily, with only a few grammes of animal protein a week; then finally three months' rehabilitation on a rich ration. One of the important findings was that the Calorie value per unit of oxygen consumption remained constant. But adaptation to the low diet was notably present, and the question arose how this was effected. Diminution of voluntary physical activity was found, as we might expect, to be a big factor; the men tired early and were aware of loss of strength and showed exhaustion readily. But there were other considerations. The basal metabolic rate fell, but this could be accounted for in large measure: firstly by the shrinkage of the metabolizing mass of tissue, for loss of weight was rapid at first, and then followed the law of diminishing decrements becoming eventually asymptotic to a reduced weight which showed fair constancy; in the second place the body temperature dropped, and this was in itself sufficient to produce some lowering of the basal metabolic rate. As was known from earlier investigations on starvation, the brain and skeleton remained almost intact, whereas big losses were sustained by fat, liver, skin and muscles. A departure from recognized doctrine was the well-authenticated fact that the heart, instead of being shielded like the brain and skeleton from loss, actually sacrificed a considerable fraction of its substance. Another normal level maintained was that of circulating plasma protein, though cells and tissues in general showed diminution of their protein content. When starvation is protracted a time comes when the plasma proteins can no longer be kept at their old level, and when this occurs there follow quickly the dangerous states of œdema, polyuria, bradycardia and extreme weakness. When allowance was made for decrease of mass of active tissue and for lowering of temperature, it was nevertheless obvious that the basal metabolic rate had fallen, and so this can be classed as one of the adaptations to a biologically difficult situation.

Mention may be made here of certain problems not investigated in these Minnesota experiments. One is the effect of race. There is some evidence for the view that white people do not adjust themselves to starvation as well as coloured. Clive's native soldiers who asked that the white men be given rice whilst they could manage with the water in which it was boiled recognized the higher food demands of their British officers. Eskimos when far from supplies are reputed to withstand starvation better than white folk. A living thing has been likened to a wave on a rapid, possessing an individuality, though never composed of the same fluid one moment before or after inspection. Radioactive trace elements have demonstrated that the drift of matter through tissues which have only a physical task to perform, such as bone, is much greater than had been suspected. The question arises just what relation exists between the velocity of this drift and vital health. Another point is that in the absence of food not only is there a fall in basal metabolism—hence the usual pre-breakfast estimation—but intestinal motility is also reduced, leading to better absorption. When food is taken the basal metabolism shoots upward long before any of the products of digestion can enter the blood-stream and intestinal movements are enhanced—actually some recent work reported by B. Anderson *et alii*[1] indicates that stimulation of the superior laryngeal nerve in swallowing

[1] *Science*, August 25, 1950, page 215.

[1] *Acta physiologica Scandinavica*, Volume XX, 1950, page 253.

reflexly augments bowel motility. "The Minnesota Experiment has provided a quantitative description of a few facts concerning the adaptation of man to caloric restriction." As is pointed out, most adaptations to stressful new conditions are compromises. Survival is maintained, but at a price.

Current Comment.

THE FUTURE OF CLINICAL ELECTRO-CARDIOGRAPHY.

IT would be rash to attempt a prophecy of the future developments of any application of medical science in daily practice, but it is interesting to pause from time to time and to trace the steps of the pathfinders. Numbers of contributions to current literature have followed the history of electrocardiography, in which the physiologists, the mathematicians and the electronic experts are seen far out in front, with the conservative physician behind at the bedside, using the latest compromise between simplicity and accuracy in the diagnosis of cardiac disease. A recent issue of *Circulation* has been devoted to the subject of electrocardiography in honour of Frank N. Wilson, who has worked long in that field, and in this Louis Katz recalls a conversation with Sir Thomas Lewis in 1935 in which this distinguished pioneer remarked that "the cream had been skimmed off" the subject.[1] Three years earlier Lewis made similar remarks to an Australian physician visiting London, and it was evident then that he felt some scepticism concerning the validity of the electrocardiogram in the assessment of the state of the myocardium. Even today, with the advantages of the chest leads and unipolar cardiograms, most cardiologists would be somewhat conservative, but there can be no doubt that electronic exploration of the heart and its function has gone far beyond the point where the MacKenzie school spent its early enthusiasm in the study of the irregularities.

W. M. Bayliss in 1918 stated that the chief value of the electrocardiogram was the detection of abnormalities in transmission from auricle to ventricle, but he added that conclusions based on changes in the form of the ventricular complex rested on an uncertain basis until more was known about the precise meaning of the components.[2] Much more is known now about these components, and this knowledge we owe to the improved methods mentioned above and to the linkage of the results they gave with careful clinical and histological studies. Further progress needed new or modified weapons, and it is fitting that due recognition be given to the influence of the physicist and the mathematician. Katz in a useful summary of the past and future developments of electrocardiography, points out that analysis of the contours of the graphic pictures drawn by the instrument has been largely empirical in the past, and warns us that specific pictures are not always indicative of the specific changes thought to be characteristic of certain conditions. In the same journal Gordon B. Myers writes of the graphs obtained from precordial leads in bundle branch block, and shows how confusion may occur between these and similar leads in cases of coronary occlusion; he also reminds us that the now well-known changes in the tracing due to hypopotassæmia may also be mistaken for those of subendocardial ischæmia, in particular the depression of the *RS-T* junction and the inversion of the *T* wave.[3] Such warnings are frequently uttered in the literature. For example, Torgny Sjöstrand has recently pointed out that variability in the *T* wave may occur in healthy subjects under the influence of certain drugs, physical exertion and alterations in posture. These changes, and also alterations in the *S-T* level, may occur apart from pathological states, and Sjöstrand gives a caution against the drawing of deductions from minor variations in the tracing.[1] This, of course, does not suggest that all electrocardiograms should not be subjected to careful scrutiny and measurement, Katz expresses his view in an aphorism: "So your electrocardiogram is abnormal, so what!" This he considers should indicate the attitude of the clinician.

Katz regards the stereo-vector-cardiogram as the future promised land of cardiography. The need for a mathematical approach has been evident since the introduction of the modern additional leads, although much most useful information has been gleaned by combined clinical and pathological studies. An editorial article reveals that Wilson, being forced to take a sabbatical year for reasons of health, used his leisure in an enthusiastic study of higher mathematics, and thus refreshed his outlook on the problems of electrocardiography. It certainly may seem at first sight that vector analysis is a subject too technical and perhaps too remote from the practice of medicine to be seriously considered as an aid to the diagnosis of maladies of the heart, but brief review of the subject soon shows that this is not so. Katz states the matter simply by pointing out that the heart and the body which conducts its action currents are tri-dimensional, and that these electrical changes have quantity, positive or negative orientation and direction. We have always accepted the Einthoven triangle, on which conventional electrocardiography rests its basis, as a mathematical assumption with an obvious drawback, in that it was only bi-dimensional. There was no objection to that for most work on the irregularities, but once the ventricles' function and structure were the subject of exploration, it could be seen that there might be fallacies in empirical methods. Keith once said that the heart was the most difficult of all organs to orientate, a statement with which even pathologists should agree. If then it is desired to include the quantity, the quality and the direction of the impulses derived from the heart, some tri-dimensional picture must replace the Einthoven flat triangle, and directional changes must be registered within this. It is obvious that the technical problems are great, and only the mathematician can fill the gap until methods can be devised which are not too complicated for clinical use. J. A. Cronvich, J. A. Abildskov, G. E. Burch and C. E. Jackson contribute studies in the standardizing factors, using an equilateral tetrahedron, an isosceles tetrahedron, and a cube as the conventional figures, and also discuss the validity of the tetrahedral systems. These studies are of necessity mathematical, but it is not suggested that it is necessary for physicians to understand the methods by which results are obtained. It is, nevertheless, necessary to understand whither electrocardiography is going. At the recent meeting of The Royal Australasian College of Physicians a preliminary communication was made on spatial vector electrocardiography by T. E. Lowe, and while he pointed out that the work was not yet past the experimental stages, he showed that interest in these developments is live in this country. These advances are healthy ones for medicine. The greater exactitude of the mathematician cannot be applied to all the infinitely variable changes of the ailing body, but his help is greatly needed in much of our work, and for it we are grateful.

[1] *Circulation*, July, 1950.
[2] *Ibidem.*
[3] "Principles of General Physiology", 1918, Second Edition.

THE SPLEEN AND PREGNANCY.

THE relationship of splenic function and of splenectomy to pregnancy was one aspect of the subject not referred to by C. R. B. Blackburn and W. L. Calov in their informative papers on the indications for splenectomy recently read at a meeting of the New South Wales Branch of the British Medical Association (see THE MEDICAL JOURNAL OF AUSTRALIA, October 28, 1950). It was perhaps not required by their general theme and could scarcely

[1] *Acta medica Scandinavica*, Volume CXXXVIII, Fasc. III.

have been included in necessarily short papers. Nevertheless, it is of considerable interest and can be of great importance to the obstetrician. Indeed, Thomas W. McElin and Robert D. Mussey,[1] after a thorough review of the literature on the subject, allow themselves the dramatic comment that certain splenic diseases and the disordered physiology resulting from them, on occasion, can become "of tremendous and even catastrophic importance" to the obstetrician. Catastrophic is not too strong a word for spontaneous rupture of the spleen or of splenic aneurysms during pregnancy; the associated mortality is very high, but fortunately these conditions are rare. Hæmorrhagic complications may offer a problem with certain splenic disorders, but common sense in obstetrical management may solve the difficulty. Dameshek is quoted to support the view that splenectomy should be carried out during pregnancy if it is hæmatologically indicated, in order to protect the mother from hæmorrhage at the time of delivery (if possible) and the baby from thrombocytopenia. The obstetrician will be wise to make use of the consultant services of a hæmatologist. In addition to their review of the literature McElin and Mussey have examined the records of 543 women who underwent splenectomy at the Mayo Clinic in a period of forty-one years. The data from these records and from responses to *questionnaires* reveal a fertility rate of approximately 65% after splenectomy, a fœtal survival rate of about 75%, and a maternal mortality of about 3%. It is concluded that, despite the increased incidence of intrapartum and postpartum hæmorrhage among patients whose spleens were removed for thrombocytopenic purpura or congenital hæmolytic icterus, the hazard of pregnancy in this series was not significantly greater than in the normal woman; in fact, no maternal deaths were recorded. However, when splenectomy had been performed for splenic anæmia and Banti's disease, the hazard to the mother and to the fœtus distinctly exceeded the normal risk. Other important observations were made and warrant consideration. McElin and Mussey remark that the specialist in female diseases should be particularly aware of the role of the spleen in both pregnant and non-pregnant women, and that he should be prepared to discuss the prognosis of pregnancy with the splenectomized woman and her attending doctor. Their comprehensive review should help a good deal towards that end.

THE RICE DIET IN THE TREATMENT OF HYPERTENSION.

THE rice diet for the treatment of hypertension, introduced by W. Kempner in 1944, was discussed in these columns on December 4, 1948. Reference was made to Kempner's own impressive results, as reported, and to the less favourable, sometimes adverse, comments of others. In a subsequent paper, read at a meeting of the American College of Physicians, Kempner[2] has discussed the basis of his treatment and provided evidence of its effectiveness, rightly used. It is significant, and goes far to anticipate the misgivings and opposition of some other investigators, that Kempner's paper opens with the sentence: "The treatment of heart and kidney disease and of hypertensive and arteriosclerotic vascular disease with the rice diet is either ineffective or dangerous, unless it is done under rigidly controlled conditions."

In view of this, it is interesting to note that a recently issued report to the Medical Research Council[3] on the rice diet in the treatment of hypertension supports Kempner's claims with qualifications about the treatment that Kempner himself would probably be the first to appreciate. The report records a clinical trial carried out by a small committee formed at the request of the Medical Research Council. The members of the committee were D. R. Cameron, D. M. Dunlop, Robert Platt, M. L. Rosenheim and E. P. Sharpey-Schafer, all but one of whom (Cameron) hold chairs of medicine or therapeutics. The results, it is made clear, are those of short-term trial only. The diet used was that described by Kempner, and his directions were closely followed. Patients were selected for treatment with severe and moderately severe hypertension, whether due to essential hypertension or to chronic renal disease. As far as possible, patients were selected who, during at least ten days in hospital with moderate bed rest, had an average diastolic blood pressure of at least 120 millimetres of mercury. The blood pressure was recorded daily by the same observer after the patient had rested quietly in bed for at least an hour. The results, the committee consider, confirm the claims made by Kempner. The average fall in blood pressure among 35 patients treated, over periods ranging from twenty to ninety-five days, was 55 millimetres of mercury (systolic) and 26 millimetres (diastolic). Of 33 patients with symptoms referable to hypertension, 25 obtained relief. Headaches disappeared in all but four of 26 cases in which they had been present. An important practical comment of the committee is that their experience suggests that few patients, in their country, could be persuaded to stick strictly to the diet for much longer than six weeks, and further that the home use of the diet or its modification is not easy. Thus it is unlikely that we can expect further reports on long-term trials comparable with those reported by Kempner, whose patients seem more easily reconciled to the monotonous, unappetizing diet. One view of Kempner's of which the committee is not convinced is that the low sodium, low protein and low fat content of his diet is important in each case. Most workers attribute a fall in blood pressure to the sodium restriction, and the committee found that in several cases the addition of sodium chloride to the diet led to a rise in blood pressure. Their observations lent no support to the possibility that protein restriction was an effective factor in the diet. They found that three patients investigated were still in slightly negative nitrogen balance at the end of six weeks; in two cases in which progress was further followed, the original negative balance became gradually less. They consider that the progressive loss of weight observed in most of their patients may be related to this negative nitrogen balance, to an insufficient caloric intake, or to loss of œdema. They observed a steady fall in blood pressure in patients who maintained their weight after an initial fall during the first few days, a finding that makes it unlikely that inanition is an important factor. The low fat content of the rice diet is presumed to be responsible for the fall in plasma cholesterol level in patients with an initially high level, but the committee have found no correlation between fall in blood cholesterol level and fall in blood pressure. The committee are also unconvinced that their results can be explained by psychological factors or rest, as certain authors have contended. The danger of the diet they emphasize. They have observed one case of uræmia, and state that if, in non-œdematous patients, the urinary sodium or chloride value does not fall to a low level within a few days of commencement of the diet, the blood urea and blood sodium contents must be carefully observed. Impairment of renal function during the diet has been confirmed; the glomerular filtration rate is affected to a greater extent than is tubular reabsorption.

The committee's summing-up is that the rice diet is of great experimental interest, for it may help to throw new light on the relationship of sodium chloride to hypertension, and it provides an elimination diet to which substances may be added to test their effect on the blood pressure. It is believed that the Kempner rice diet can be expected to produce a considerable fall in blood pressure in about 70% of patients with either renal or essential hypertension, provided that they adhere strictly to the régime; this fall is often accompanied by great symptomatic relief. Clearly, however, as the report concludes, it is extremely difficult for patients to continue with the diet for more than two months, and as soon as the sodium chloride intake is increased even slightly the blood pressure is likely to rise again. It appears, therefore, that this régime will not become a popular form of therapy. Just how Kempner manages to keep his patients faithful not just for months but for years (as his reported results show) would be worth knowing.

[1] *International Abstracts of Surgery*, August, 1950.
[2] *Annals of Internal Medicine*, November, 1949.
[3] *The Lancet*, November 11, 1950.

Abstracts from Medical Literature.

OPHTHALMOLOGY.

Ophthalmoplegia and Pigmentary Degeneration of the Retina.

MAX CHAMLIN AND EDWIN BILLET (*Archives of Ophthalmology*, February, 1950) report three cases characterized by insidious onset of chronic, progressive external ophthalmoplegia and development of atypical pigmentary degeneration of the retina in adolescence or early adult life. They state that the presence of pigmentary changes can be of great value in clinical differentiation of this condition from such conditions as *myasthenia gravis*, tumours and vascular anomalies. When evidence of paralysis of the third, fourth or sixth nerve is present, and when the history, X-ray findings, reaction to neostigmin and other findings are inconclusive, the presence of pigmentary changes in the retina can be of aid in the diagnosis of a degenerative disease, and thus obviate the necessity for angiography, air studies and other surgical diagnostic procedures.

Lesions of the Eye from Radiant Energy.

DAVID G. COGAN (*The Journal of the American Medical Association*, January, 1950) defines the types of radiation which have given rise to ocular lesions, discusses the transmission and absorption of radiant energy in the ocular media and describes the clinical characters of the lesions caused by the various types of radiant energy. The common sources of radiation include radio transmitters, diathermy machines, high temperature furnaces, sun, welders' electric arcs, X-ray tubes and radioactive substances. The cornea is affected by the non-penetrating forms of radiation, such as the long infra-red, the ultra-violet, the *Grenz* and β rays. It is also affected by the penetrating radiations, that is, X and γ rays. The effect of these various rays on the cornea is to produce keratitis with epiphora, photophobia, pain and blepharospasm. The lens is particularly susceptible to several types of radiant energy. The cataracts resulting from passage of electric current have a variable latent period, usually several months. The cataracts began in the anterior part of the cortex and anterior capsule. Cataracts caused by infra-red radiation were first observed in glass blowers. Infra-red cataracts occur only after exposure to intense heat for many years. These cataracts are posterior cortical, forming at first saucer-like opacities belonging to the general group of so-called *cataracta complicata*. There may also be a lamellar splitting of the anterior capsule. There is no positive evidence that cataracts may be produced by visible radiation. The lens has come to be considered the tissue most sensitive to X rays. The latent period is usually six months to two years. The cataract commences as an opacity in the posterior pole, it is sharply demarcated from the rest of the cortex and frequently has a multifoliate shape. Cataracts from γ rays and neutrons are similar to those produced by X rays. Short infra-red rays and the visible rays cause thermal burns of the retina. The retinal lesion appears first as a hazy opacity in the macula, often with apparent accentuation of the foveal red spot. Subsequently the lesion becomes pigmented, and a hole may develop in the fovea. The only adequate treatment for radiation lesions of the eye is prophylaxis.

Advanced Chronic Simple Glaucoma with Telescopic Fields.

SYLVAN BLOOMFIELD AND LEO KELLERMAN (*American Journal of Ophthalmology*, September, 1949) statistically evaluate the advisability of surgical intervention in eyes reduced to telescopic fields by advanced chronic simple glaucoma that is medically uncontrolled. Forty-one eyes were studied with uncontrolled chronic glaucoma and fields constricted to 10° from fixation in all meridians. Of these 19 were operated upon with subsequent loss of some visual acuity in most cases, and a reduction in acuity to less than 20/200 in about half, over a follow-up period of a little over two years. In the remaining 22 eyes, the tension remained above normal range, but no surgery was performed. Over the same period of time some visual loss occurred in eight cases, and an extreme reduction in acuity to less than 20/200 in three cases. It is concluded that in eyes with advanced simple chronic glaucoma central vision may be retained for long periods in spite of inadequately controlled tension, and that in such cases operation to reduce tension is contraindicated.

Late Fistula Formation in Operation Wounds.

J. H. DUNNINGTON AND E. F. REGAN (*Archives of Ophthalmology*, March, 1950) describe a method of dealing with late fistula formation and hypotony following intraocular surgery. The type of case referred to is that in which there is a slow or intermittent leakage of aqueous. The patient has usually had an uneventful intraocular operation and post-operative course. Weeks or months later the patient returns complaining of lachrymation and intermittent blurring of vision. Examination shows profuse lachrymation, white eye, clear cornea, and an anterior chamber of normal depth. The tension is low. The wound frequently encloses a cystoid area of conjunctiva that is soft and pits on pressure. If one places a drop of fluorescein on the suspected area and then applies gentle pressure to the globe a leakage of aqueous is usually demonstrable. If the condition is allowed to persist the visual acuity will decrease. A late complication is epithelialization of the anterior chamber. The authors recommend suturing of the fistula together and covering of the wound with a conjunctival flap. They describe their technique and report 15 cases in which the surgical procedure advocated was used.

Epithelial Invasion of the Anterior Chamber after Cataract Extraction.

MORRIS H. PINCUS (*Archives of Ophthalmology*, March, 1950) reports five cases of the rare condition of epithelial invasion of the anterior chamber after cataract extraction. Epithelialization of the anterior chamber occurs when there has been slow healing of the corneal wound, with delayed formation of the anterior chamber. A slowly healing wound, delayed formation of the anterior chamber and leaking of the aqueous are potential precursors. If, in addition, one discovers a thin haze on the posterior surface of the cornea, beginning at the wound and extending downward as time goes on, the possibility is no longer remote. The time interval in which epithelialization of the anterior chamber was recognized in the cases reported varied from three weeks to five months. If it is allowed to progress the eye is lost through severe irido-cyclitis and glaucoma. Operative intervention hastens destruction of the eye. The use of X-ray therapy or the radon plaque offers hope of retarding, arresting or even curing this condition.

Experiment in Glaucoma Case Finding.

E. CARPENTER, S. BRAV AND V. SEIDEL (*American Journal of Ophthalmology*, April, 1950) present a preliminary report on the incidence of glaucoma. It is based on a mass screening by ophthalmologists of 3923 employees of departmental stores in Philadelphia. The examination was used as a simple screening experiment to test the possibility of uncovering early glaucoma without exhaustive diagnostic procedures. It consisted of visual acuity measurement, external examination of ocular movements, size of cornea, condition of anterior chamber, pupillary reaction and condition of the iris, fundus examination, and measurement of intraocular pressure by tonometer. All persons with intraocular pressure of 25 millimetres of mercury (Schiotz) or more were rechecked twice. If these additional measurements were above 25 millimetres of mercury or if fundus examination showed suspicious findings, the employee was then referred to either an ophthalmologist or an eye clinic for further investigation. Of the 3923 persons examined glaucoma was diagnosed in 65 (1·65%), and 24 are under observation. The rate of incidence is expected to be approximately 2%. Provocative tests were impracticable, and it is believed that multiple tonometric examinations would in the long run uncover as much information as could be gained by provocative tests. The authors advocate the use of such mass surveys in order to uncover early glaucoma.

Slit-Lamp Microscopy with the New Preset Lens.

K. HRUBY (*Archives of Ophthalmology*, February, 1950) describes the technique of examination of the posterior section of the eye with his new preset lens; this is a spherical *minus* lens of 55 dioptres, with a slightly convex anterior surface (*plus* five dioptres), which is held in front of the eye to be examined. The advantage over the contact lens is ease of handling without inconvenience to the patient, making it possible to examine children and injured and recently operated eyes. The examination may be of any length and frequency. The preset lens produces a smaller field of vision than the contact lens and shows the fundus in its natural size with variations caused by the refraction of the eye. For observation of the posterior segment of the eye the following conditions must be

fulfilled: the best possible mydriasis, good dark adaptation of the examiner, good illumination and bringing together of the arms of the slit lamp and microscope until the smallest possible angle is reached, and the reduction prism in place. The *minus* lens must be set as near as possible, and it must be well centred. All other conditions being the same, the part of the fundus which can be seen binocularly increases, the wider the pupil, the less myopic or the more hypermetropic the examined eye is and the closer the preset lens can be set in front. The author finds the method of examination indispensable in cases of retinal detachment, for discovering very flat detachments and for diagnosing chorioidal tumours, cysts of the retina and retinoschisis. He regards it of value in diagnosing papilœdema and for analysis of various diseases of the macula.

Choice of a Miotic Agent after Retrobulbar Anæsthesia.

HAROLD G. SCHEIE AND GAYLORD OJERS (*American Journal of Ophthalmology*, October, 1949) have conducted experiments to ascertain the action of miotics after retrobulbar anæsthesia. They found that retrobulbar injection of procaine hydrochloride produced dilatation of the normal pupil in thirty to sixty seconds. Pilocarpine 1% constricted the pupils to three millimetres in an average time of twenty-four minutes. Eserine 0·5% produced miosis in eighty minutes. "D.F.P." produced miosis after one hundred and twenty minutes. Eserine and "D.F.P." became effective only after the effect of the retrobulbar injection began to wear off. After this interval the effect of eserine was rapid. When miotics were used before retrobulbar injection, it was found that no dilatation of the pupil occurred if pilocarpine had been used, but eserine or "D.F.P." did not prevent dilatation of the pupil. When the pupils were dilated with homatropine, the pilocarpine was ineffective in producing miosis, whereas eserine produced rapid miosis. However, if paredrine was used as the mydriatic, the pilocarpine and eserine were equally effective. The authors suggest that pilocarpine should be used if a miotic is required after cataract extraction performed under retrobulbar anæsthesia. Paredrine is a more nearly ideal mydriatic agent than homatropine because it is more readily counteracted by pilocarpine. If mydriasis is to be prevented after retrobulbar injection of procaine, pilocarpine should be used beforehand.

OTO-RHINO-LARYNGOLOGY.

Mucocele of the Frontal and Ethmoid Sinuses.

S. KAPLAN, A. SCHWARTZ AND B. F. METSON (*Archives of Otolaryngology*, February, 1950) state that after radical procedures carried out on the frontal and ethmoid sinuses there is a tendency for the orbital tissues to move medially and, by formation of fibrotic bands, to be drawn towards the interfrontal septum and thus to close off the reconstructed frontal passage. If this occurs and if mucosa is still present in the occluded sinus, a mucocele is likely to develop. Repeated operations are often performed in an attempt to effect a cure. The causes of failure are obstruction of the frontal passage by fibrotic or bony closure of the reconstructed passage. Remnants of the frontal floor and incompletely performed ethmoidectomy may also be responsible for failure. Rubber tubes, mucous-membrane flaps and skin grafts have been employed, but still with a high incidence of failure. The authors discuss the use of acrylics and tantalum in the treatment of eight cases. Usually exenteration of the ethmoid and frontal sinus is performed through the Lynch external approach. An acrylic tube was first employed to extend from the fronto-ethmoidal cavity down to the floor of the nose, but this was found to cause some irritation, so that the tube was later shortened to reach down only as far as the superior level of the inferior turbinate body. Originally the acrylic obturators had a central lumen, but this was soon found to be unnecessary, as crusting often reduced the lumen, while adequate drainage apparently took place around the outside of the tube. The tube is held in place with a tantalum suture loosely secured to the overlying periosteum and muscle tissue. If the operation cavity extends far laterally a malleable tantalum foil apron is sewn to the orbital periosteum of the lateral extremity of the frontal cavity. The other end of the tantalum apron is allowed to drape medially over the orbital contents and hang down into the nose. It is essential that the tantalum apron and acrylic tube be left in place for an indefinite period, possibly permanently. Neither has excited any foreign body reaction. Mild crusting of nasal secretions takes place on the acrylic tube, but none has been observed on the tantalum foil.

The Decibel, the Phon and the Sone.

A. TUMARKIN (*The Journal of Laryngology and Otology*, April, 1950) presents a consideration of certain physical, physiological and psychological aspects of loudness with special reference to the pathogenesis of recruitment, together with an account of certain allied phenomena of potentially diagnostic significance. He states that the various hair cells of the organ of Corti are assumed to move more fully with vibrations of the basilar membrane, the further they lie from the fixed extremity of the basilar membrane at the *lamina spiralis*. The outermost of the four outer hair cells will move most freely and readily, while the single inner hair cell will require the greatest stimulus to cause movements to take place. It has been shown, too, that the outer cells deteriorate more rapidly than does the inner hair cell in such conditions as senility, quinine poisoning *et cetera*. At the threshold of hearing the outermost of the four outer hair cells alone is firing, and as the intensity of the stimulating tone rises, two things happen. First, the frequency of the impulses from this cell increases up to a maximum, and secondly, the cell next inwards is gradually brought into action. As the intensity increases further, the zone of excitation gradually moves across the basilar membrane, progressively activating the more inwardly placed cells. It is assumed that each cell has a certain maximum output of impulses and that, as the cells are progressively brought into action by progressively louder stimuli, a pattern is made on the end organ, just as pitch is thought to be determined by a pattern on the basilar membrane. There are two distinct factors in the pattern: first, the geometrical shape of the excitation on the basilar membrane, and second, the frequency of impulses travelling along each nerve fibril leaving that area. In the normal ear, these two factors bear a definite and fixed relation to each other. A given tone of a given intensity not only stimulates a definite area of the membrane, but it evokes from every cell in that area a definite amount of activity. In deterioration of the hair cells, however, whilst the geometrical pattern is unaffected, the output from individual hair cells is profoundly modified. Thus the pattern becomes mutilated. These multilated patterns have some definite loudness ascribed to each of them through an ability to relate the loudness in the diseased ear to some different value in the healthy ear. The author suggests that to the fragmentary patterns there is ascribed the loudness value of the original complete pattern. Thus is explained our ability to fill in gaps from an imperfect source of sound such as over a faulty telephone or catching a few words in a noisy room. The loudness recruitment phenomenon is explained on the basis that while degeneration of the hair cells is prone to occur progressively from without inwards, sounds of increasing loudness are still able to activate the remaining more inwardly placed hair cells; these normally fit into a cochlear pattern, which is in turn associated with a memory pattern interpreted as being of a certain loudness. In passing from soft to loud sounds, more and more of the more inwardly placed hair cells are stimulated, so that a progressive recruitment occurs until what appears to be nearly normal loudness is appreciated by the deafened ear. In conduction deafness, the difference in pattern always corresponds to the uniform interference with stimulus intensity caused by the impediment in the conducting apparatus, so that recruitment does not occur. In nerve deafness due to a tumour of the eighth nerve, the output of all the hair cells is diminished by an equal amount, so that there is the same discrepancy at all intensities of sound stimulus, and again recruitment is not able to be demonstrated.

The Treatment of Recurrent Otitic Barotrauma by Irradiation.

E. D. D. DICKSON AND J. E. G. MCGIBBON (*The Journal of Laryngology and Otology*, November, 1949) state that work was undertaken to determine a suitable method of treatment by irradiation of a series of patients suffering from recurrent otitic barotrauma. A study was made of the relevant anatomical features and equipment devised which would enable the source of irradiation to be placed in a known position in the nasopharynx in relation to the Eustachian tube. The method is described in detail. In the treatment of otitic barotrauma 36·5% of cases responded successfully to the dosages between 860*r* and 1245*r*, while with dosages between 1250*r* and 1520*r*, the success rate was 56%.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at Saint Vincent's Hospital, Darlinghurst, on October 19, 1950. The meeting took the form of a series of clinical demonstrations by members of the honorary medical and surgical staff of the hospital.

Acquired Melanosis.

DR. V. J. KINSELLA used a coloured transparency to illustrate his report of a male patient, aged fifty-three years, who had presented for examination on April 1, 1949. A black patch had appeared on the skin of the patient's left thumb over four years previously, and had gradually spread until it covered almost the whole of the terminal phalanx. The patient had been reassured by many doctors, including a dermatologist, who had taken a biopsy, that the condition was harmless. A lump had appeared in the left axilla three weeks previously.

On examination of the patient it was noted that the nail of the terminal phalanx and most of the skin were black. The margin of the black area was sharply defined. A more intense black area on the medial side met a less intense black area on the lateral side, along a sharply defined longitudinal straight line on the nail. The black skin differed from the normal skin in no way, except in colour. Inspection, naked-eye and with hand lens, revealed normal skin ridges, with the normal openings of sweat glands. On palpation, the texture and thickness of the skin were found to be unchanged. In the axilla were large hard lymph glands. A search failed to reveal any nodules between thumb and axilla, or elsewhere. On April 22 the thumb and the axillary glands were removed. Dr. A. H. Tebbutt supplied the following report:

> The axillary fat contains several massive tumours, one 5 cm. in diameter, and another 4 cm. in diameter, with variegated cut surfaces, black, red and grey. Microscopical examination shows a malignant melanoma metastasis, the cells being round and polyhedral and spindle-shaped, melanin pigment is scattered amongst them and there is much necrosis and hæmorrhage. The thumb shows the nail black, and the skin for some distance around is deeply pigmented. Microscopical examination of the sections shows much pigment in the deeper layers of the epidermis, and in one place, under the edge of the nail, is a small mass of malignant melanoma cells, which is undoubtedly the primary growth.

The patient died eleven months after operation with multiple and widespread metastases.

Dr. Kinsella said that the case was presented because the condition of acquired melanosis was not generally known, and when met with it was not always recognized as a pre-malignant condition and dealt with, as it should be, by thorough excision in the premalignant stage. An average period of ten years elapsed between the appearance of the pigmentation and the onset of malignancy.

Acute Volvulus of the Sigmoid Colon with Auto-Colectomy and Cure.

Dr. Kinsella's second patient, a single woman, aged forty years, had been admitted to hospital on May 15, 1950, with acute intestinal obstruction of three days' duration and an extremely distended abdomen. Skiagrams were taken, and the sigmoid colon was thought to be the site of obstruction, probably through carcinoma. A transverse colostomy was performed. On May 17 there had been very little discharge from the colostomy opening, and the patient appeared moribund. She was too ill to move to a trolly. Under local anæsthesia, a "caecostomy" was performed, well over to the right in the right flank, and the patient was not moved from the bed. The "caecum" was gangrenous, and, on incision, gas escaped with an audible explosion; the abdominal distension at once disappeared. On July 3 the patient was much better, but was running a "swinging" temperature. On this date a piece of gangrenous bowel about twelve inches long, with mesentery, was removed from the caecostomy wound, and 15 to 20 ounces of pus escaped. After that, the temperature became quite normal, and the patient quite well. But the problem had to be solved—the "caecum and ascending colon" had become gangrenous (it was thought through back pressure) and sloughed; and the opening in the transverse colon was discharging normal fæces. The problem was submitted to the radiologist; barium was administered to the patient by mouth, *per anum*, and by each stoma of the transverse colostomy, and Dr. P. Wightman determined that the sloughed bowel was the sigmoid colon. It had undergone volvulus. The patient was presented together with the original plain skiagrams taken on her admission to hospital; these were reviewed to see if there was any clue to the correct diagnosis. Dr. Kinsella said that even in the light of after-knowledge, interpretation was difficult. At the time of the meeting the patient was well, and awaiting reconstruction of the colon. The case served to illustrate what Nature could do, if aided, but not hindered.

Macrocytic Anæmia.

DR. JAMES SHERWOOD presented a woman, aged seventy-three years, who had been suffering from tiredness, weakness and headache for two years, anorexia for one year, and dizziness for four months. Clinical examination suggested a diagnosis of pernicious anæmia, and that was confirmed by the findings of a blood count and a fractional test meal examination. The response to treatment with liver extract given parenterally had been satisfactory, except for a slight delay in the reticulocyte response. A dubious result from a blood Wassermann test, with positive results from Kline and Eagle tests, had been the only complication.

Dr. Sherwood pointed out that the anæmia of late syphilis produced blood changes identical with those of pernicious anæmia, but it was still felt that the diagnosis was one of pernicious anæmia, with syphilis (if eventually proven) incidental rather than ætiological. The patient was shown because of the contrast to the next patient to be shown, who was suffering from refractory megaloblastic anæmia, and not because of any outstanding feature of her own, other than the fact that the anæmia was also refractory to some degree to standard treatment with liver extract.

Dr. Sherwood's second patient, a man, aged forty-two years, was also suffering from macrocytic anæmia. The patient had a long history of diarrhœa and a fairly long history of alcoholic indulgence and presented a more difficult problem. He appeared to be suffering from a refractory type of megaloblastic anæmia associated with probable hepatic cirrhosis and the sprue syndrome. Full investigation and treatment had not yet been completed. The interesting features in his case were the difficulty in explaining the full ætiological sequence of his condition and the refractory nature of his megaloblastic anæmia. So far the administration of proteolysed liver seemed to be producing most therapeutic effect, with production of a rise in hæmoglobin content of the blood and commencing reticulocytosis (8%). The leucocyte count had been restored to normal from a figure of 1900 per cubic millimetre three weeks previously.

Tuberculous Meningitis.

Finally, Dr. Sherwood discussed a case of tuberculous meningitis occurring in an adult woman suffering from pulmonary tuberculosis. She had been receiving 100 milligrammes of streptomycin daily by the intrathecal route and two grammes of streptomycin daily by the intramuscular route for almost six weeks. After three weeks' treatment the Queckenstedt test result had become negative, and consequently, owing to cerebro-spinal block, intrathecal injections had had to be discontinued. Dr. Douglas Miller made two burr holes in the skull, and then intraventricular injections of 100 milligrammes of streptomycin daily were given. That improved her condition and converted rather dilated sluggish pupils to normally sized active ones. PAS, 10 grammes per day, was later given, by mouth, in addition to the other treatment. The patient's general condition had fluctuated considerably; at times, improvement with rational speech had occurred. At other times she had lapsed into semi-coma. On the whole, her general condition, so far, had deteriorated. Dr. Sherwood presented the results of cerebro-spinal fluid examination in specimens of lumbar puncture fluid and of ventricular fluid. He pointed out the noticeable contrast between the two specimens, with the evidence of cerebro-spinal block; also the early reduction in sugar content and the persistent low chloride content of the fluid.

Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING of the Medical Sciences Club of South Australia was held in the Anatomy Lecture Theatre, Frome Road, Adelaide, on October 6, 1950.

The Adrenal Cortex and Hypertension.

DR. BASIL HETZEL read a paper on the adrenal cortex and hypertension. He said that there were probably many causes of human hypertension, but in the great majority of cases the particular factors at work were unknown. Recent work on the adrenal cortex had pointed to the possibility that that gland was involved. Clinically the association of hypertension with Cushing's syndrome was well known, while the occurrence of hypertension in patients suffering from Addison's disease receiving DCA therapy had also been noticed. DCA was pressor in effect in normal and hypertensive subjects—an effect antagonized by simultaneous administration of whole adrenal cortical extract. Cortisone had been found depressor in effect in hypertensive subjects. Vascular lesions similar to those in hypertension had been described by Selye in animals as a result of massive doses of DCA and salt. Those effects could be inhibited by cortisone. Dr. Hetzel went on to say that in the light of the clinical and experimental observations mentioned it was necessary to know whether there was any disturbance of adrenal cortical function in other clinical types of hypertension apart from Cushing's syndrome. Work was handicapped by lack of sufficiently precise techniques for measurement of hormone levels in the body fluids. Suitable methods for measurement of the DCA-like factors were not available, while the only specific method for glucocorticoids involved biological assay with all its attendant problems. The various chemical methods were not specific for either mineralocorticoid or glucocorticoid fractions. In association with Miss D. C. Hine, Dr. Hetzel had used the biological assay of Vening *et alii* to determine the glucocorticoid excretion in the urine of patients suffering from the various clinical types of hypertensive disease. A chloroform extract was made from a forty-eight-hour specimen and injected into fasting adrenalectomized mice, the activity being measured by assay of the glycogen content of the liver. Various difficulties had been encountered with the technique, but most of them had been overcome. Determinations had been made on a series of approximately 50 patients representative of the various clinical types, namely, renal hypertension, benign and malignant hypertension, hypertension following toxæmia of pregnancy, as well as cases associated with definite evidence of endocrine imbalance. With the exception of one case of Cushing's syndrome due to pituitary basophilia, no significant difference in glucocorticoid excretion from the normal had been found in those cases. It was provisionally concluded from the results either that adrenal cortical function was normal in hypertension or that there was a relative insufficiency of glucocorticoid production in the presence of excessive mineralocorticoid (in the light of Selye's experimental observations). The second possibility was to be investigated further, but there was at present no definite evidence in favour of any disturbance of adrenal cortical function in hypertension.

A MEETING of the Medical Sciences Club of South Australia was held in the Anatomy Lecture Theatre, Frome Road, Adelaide, on November 3, 1950.

Alkaloid Production in Plants.

DR. B. HOROWITZ read a paper on alkaloid production in plants and its significance to pharmacology and agriculture. He said that species containing alkaloids were widely distributed throughout the plant world. Though related genera contained a similar type of alkaloids, the same alkaloid was found in quite unrelated families. While resting mature seed of Solanaceæ contained no alkaloid, the latter appeared at a very early stage of germination, increasing rapidly throughout the growing period, reaching its maximum about flowering time and decreasing slightly afterwards. The decreasing order of nicotine content in various parts of a plant was that of leaf mesophyll, lateral roots, inflorescences, stalks and main roots. The xylem portion of the stalk contained more nicotine than the phloem, as through the former passed the upward movement of the alkaloid. The location of the organs in which alkaloids were formed was determined by the approach graft technique in which an alkaloid-producing plant and a non-alkaloidal one were combined in a graft, both scion or stock. That method, and also similar grafts between plants producing various alkaloids, had shown that the root was the organ in which alkaloids of a large number of Solanaceæ were formed. The transpiration stream was the agency transporting the alkaloids from the roots through the xylem portion of the stalks to the leaves. Only anabasine of *Nicotiana glauca* was produced both in the roots and in the leaves; nornicotine of some Nicotianas was formed in the leaves only as a secondary product from the nicotine of the roots by means of a transmethylation process. Feeding experiments on detached organs had shown that some amino-acids or sulphate of ammonia with sucrose acted as precursors of certain alkaloids.

Production of a high or low alkaloid content was determined by the variability and inheritance of that character. Of the environmental factors which increased the alkaloid content and yield, the following were discussed: arid or semi-arid climatic conditions with a moderate moisture supply; a heavy type of soil; nitrogenous nutrients in excesses, and cultural methods like topping and desuckering.

An interspecific variability of the alkaloid content allowed selection of the type not only with the highest or lowest alkaloid content, but also with predominance of a given alkaloid or with the most desired ratio of the various alkaloids. Intervarietal and interspecific hybrids made it possible also to incorporate some valuable agronomic characters in the cross. As interspecific hybrids were often sterile, artificial induction of polyploidy, preferably by the colchicine technique, was used. While in *Duboisia* species vegetative propagation permitted quick establishment of an improved clone, that was a more lengthy procedure in generatively propagated Solanaceæ like *Nicotiana* species. In addition to production for high alkaloid content and yield, some aspects of producing for a decreased alkaloid content was illustrated on the production of a biological denicotinized tobacco, "sweet" lupin, free of alkaloids, and *Ricinus*. The possibility was briefly discussed of introducing a number of "poisonous" plants into cultivation for human or animal consumption as a result of decreasing the amount of their "poisonous" element.

Osmoregulation in Freshwater Mussels.

MR. IAN HISCOCK read a paper on osmoregulation in freshwater mussels. He said that freshwater mussels were able to maintain a salt concentration in their blood far in excess of that of the medium in which they lived. That had a $\triangle$ of $-0{\cdot}01$ and chlorinity of less than 50 milligrammes of chlorine per litre, whereas the mussels maintained in their blood a $\triangle$ of $-0{\cdot}1$ and chlorinity of 650 milligrammes of chlorine per litre. When placed in media of varying concentration, they maintained a constant blood concentration, in other words they were homoiosmotic, until the concentration rose above their own, when they became poikilosmotic. While they were in a homoiosmotic state their body weight remained constant, but when they became poikilosmotic there was a loss of weight. Under narcosis there was a weight increase in media hypotonic to their blood. In their normal habitat there was a continuous osmotic penetration of water into their body; the water was removed by the nephridium, or kidney, which received an ultrafiltrate from the heart at the nephrostome and excreted a hypotonic urine at the nephridiopore.

Mr. Hiscock said that it was well established that salts could be absorbed through the body surface from low concentrations in the external medium. That implied an absorption against a concentration gradient, which presumably demanded work done to accomplish it. The role of calcium and the respiratory rate in that osmotic work were discussed. Mr. Hiscock summed up by saying that the mussels gained salts from absorption through the body surface, kidney and gut, and lost them in urine, fæces and diffusion. How the necessary balance was maintained was not yet known.

Correspondence.

THE HONORARY SYSTEM.

SIR: After seeing a little of the paid hospital services in England and then returning to see a little of rising costs in this country, I feel it is time we adopted a realistic attitude to the question of free treatment in our public hospitals.

Originally designed as altruistic aid to the poor, it has become an absurdity when the whole community can have our time and skill free at the expense, *inter alia*, of those who prefer to pay their way.

It is time we said to the authorities, "nominate to us the deserving sick poor and we will treat them free, but we must be paid for our other services as from such and such a specified date" (for example, twelve months' time). I suggest we should all immediately reconsider our attitude first as individuals, then in groups, and finally take collective action through the association.

Yours, etc.,

C. C. McKELLAR.

143 Macquarie Street,
Sydney,
November 16, 1950.

RELIEF FOR MEN AND WOMEN WHO SERVED IN THE 1939–1945 WAR.

SIR: The trustees of the Services Canteens Trust Fund are seeking the help of the members of the medical profession in enabling them to make the best use of the Services Canteens Trust Fund for the benefit of men and women who served in the 1939-1945 war and who unfortunately are in need of financial assistance.

It has been found that over 50% of the assistance granted from the fund for the relief of exservicemen and women in distress has arisen from medical and hospital accounts, and a large proportion of this indebtedness has resulted from attendance at private hospitals for treatment that would appear to be obtainable from public hospitals.

It is realized that in cases of emergency beds may not be obtainable at public hospitals, and for that reason patients have been admitted to private hospitals, but in very many cases in which distress has occurred and assistance has been sought from this fund, the admittance to public hospitals appeared to have been practicable. This has resulted in very large demands being made on the fund to relieve financial distress which could have been avoided. The trustees feel that it is only necessary to draw the attention of doctors generally to these circumstances and they will readily respond to the appeal of the trustees to encourage the use of public hospitals where embarrassment may be caused to the family if private hospitals are used.

Any action that may be possible in this direction would be of substantial benefit to men and women who served in the forces during the war and would help the trustees to spread the funds available over the maximum number of eligible persons.

I may add that the Services Canteens Trust Fund is being used for the assistance of men and women who served in the Australian forces in the 1939-1945 war and their dependants who are in financial distress, and to provide educational assistance to the children of such exservicemen and women in cases of need.

Yours, etc.,

R. R. GORDON,
General Secretary, Services Canteens Trust Fund.

Victoria Barracks,
Melbourne,
November 16, 1950.

A REVIEW OF SHARK ATTACKS IN AUSTRALIAN WATERS SINCE 1919.

SIR: I think that we should be grateful to Dr. Coppleson for his very useful investigations into shark attacks. But there are two aspects which need further consideration.

Digestion in the shark's stomach is of scientific interest and occasionally of great medico-legal importance. It is therefore strange that in the investigation of this important matter the well-established methods of studying gastric digestion have been neglected and our knowledge left dependent upon the hit-and-miss method of fishing for a shark after it has swallowed a human arm. Many years have now passed since Kussmaul, Leube, Ewald, Boas, Ehrenreich and Rehfuss introduced and established the use of the stomach tube and the methods of gastric analysis. Even before this, methods had been devised whereby a shark could be induced to swallow a foreign body, such as a hook. Before our shark experts and ichthyo-physiologists can be held qualified to give evidence of weight in regard to digestion in the shark's stomach, they should have carried out at least fractional test meals with estimation of acid and ferment secretion in this animal. A salmon could be used not only to bait a specially constructed gastric tube, but also to serve instead of the commonly used gruel meal. It may be advisable to try the first experiments upon "gummy sharks".

Secondly, I foresee a danger. If the shark menace be altogether eliminated, it is highly probable that more persons would be lost by drowning than would ever have been taken by sharks.

Yours, etc.,

V. J. KINSELLA.

235 Macquarie Street,
Sydney,
November 10, 1950.

THE MEDICAL BENEVOLENT ASSOCIATION OF NEW SOUTH WALES.

SIR: With the approach of Christmas, may I, through the columns of your journal, again draw the attention of the profession to the annual appeal of the Medical Benevolent Association of New South Wales.

During the past two years, payments to beneficiaries, increased to meet the rising cost of living, have exceeded receipts, and a further and greater loss is to be anticipated during the current twelve months.

If the work of the association is to continue, and the barest necessities provided for those needy, aged and sick members of our profession and their dependants, a generous support to the appeal is essential.

Yours, etc.,

R. J. WHITEMAN,
President, the Medical Benevolent Association of New South Wales.

135 Macquarie Street,
Sydney,
November 17, 1950.

OCULAR MANIFESTATIONS OF SARCOIDOSIS WITH A DESCRIPTION OF SEVEN CASES.

SIR: In reply to Dr. F. Simpson's letter (THE MEDICAL JOURNAL OF AUSTRALIA, November 11, 1950) I wish to state that the criteria used to diagnose sarcoidosis in the cases described are set out on page 570 of THE MEDICAL JOURNAL OF AUSTRALIA, October 14, 1950, in the article by Robinson and Pound.

A full description of the present status of sarcoidosis is also given in this article.

Yours, etc.

NANCY LEWIS, M.D., D.O., F.R.A.C.S. (Oph.).

111 Collins Street,
Melbourne, C.1,
November 15, 1950.

Obituary.

EDMUND HAROLD MOLESWORTH.

BY the death of Dr. Edmund Harold Molesworth which has already been recorded in the journal, Australia has lost one of its most prominent dermatologists and the medical profession a man of remarkable character and personality. For some months before he died Molesworth knew that he was suffering from malignant disease of the lung and he faced the inevitable end with great courage.

Edmund Harold Molesworth was the son of the late Edmund William Molesworth, for many years a member of the Legislative Assembly in New South Wales; from his father he inherited a sense of public duty and of service to his fellow men. As a boy he attended Sydney Grammar School which was then under the headmastership of the late Albert Bythesea Weigall. Weigall had an influence over Molesworth, as he did on many of his senior pupils. As a prefect at school Molesworth showed a directness

and force of character, which characterized him throughout the whole of his professional life. He studied medicine at the University of Sydney and graduated as Bachelor of Medicine and Master of Surgery in 1905. After graduation he was appointed resident medical officer at Prince Alfred Hospital. He worked hard, as most residents of that day did, and almost at once displayed an interest in dermatology. The late Frank Bennett was then honorary dermatologist of the hospital and Molesworth spent all the time that he could possibly spare in Bennett's out-patient clinic. When he was senior medical officer he was always to be found in the out-patient department by the side of Frank Bennett, or when Bennett was unable to be present, deputizing for him. Francis Alexander Bennett (he was always known as Frank) was a graduate of the University of Aberdeen. He was a picturesque person with a striking accent and a manner of handling patients which was all his own. To hear him and Molesworth working together in the out-patient department was not only instructive but an entertainment. After leaving Prince Alfred Hospital Molesworth went to England for post-graduate studies. In London he came under the influence of Dr. Arthur Whitfield, of King's College. In after years Molesworth always spoke of Whitfield with admiration and affection, and there is no doubt that he owed a great deal to Whitfield's inspiration and enthusiasm. From London he went to Paris, where he spent six months, and then to Berne, where he studied with Professor Jadassohn. He spent shorter periods also at Vienna and Berlin. When Molesworth returned to Sydney in 1910, he was well equipped to undertake the special practice of dermatology, and he started as a specialist in Macquarie Street. In 1912 he was appointed physician for diseases of the skin to Prince Alfred Hospital, and later became lecturer in diseases of the skin at the University of Sydney. In 1926 he obtained the degree of doctor of medicine. He went abroad again in 1927 for post-graduate study, and on his return later in the year was appointed honorary dermatologist at Prince Henry Hospital and physician in charge of the patients at the lazaret. It was in 1926 that he published in this journal a long article dealing with the leprosy problems. He was always opposed to the segregation and internment of patients with leprosy, and his arguments were sound. A year or two later, at the request of the Editor, he contributed to this journal a special article on leprosy. He was always interested in cancer of the skin, and made several important contributions on the question of solar radiation that were prominent in the discussion. He was always forthright in his arguments and attacked his critics with vigour. It is recalled that in one discussion on cancer of the upper lip he had been speaking of the effect of solar radiations. One of those present asked him why he did not wear a moustache as he advised others to do. He confounded his critics by saying bluntly: "My wife won't let me."

Molesworth took a prominent part in the activities of the Cancer Research Committee of the University of Sydney. That there were difficulties in the running of this committee is well known, and Molesworth with his friend Herbert Moran ("Paddy") was not afraid to speak his mind.

In 1937 Molesworth's *magnum opus* appeared. It was "An Introduction to Dermatology", and was published by J. and A. Churchill, Limited, London. A second edition appeared in 1944. The first edition was dedicated to Dr. Arthur Whitfield, and the second to Professor Joseph Jadassohn and Professor Arthur Whitfield. Jadassohn wrote a foreword to the book. It was characteristic of Molesworth that he should write at the end of the preface to the first volume as follows: "If the book affords interest even to a few readers to one hundredth of the degree of the relief which the completion of it has afforded me, I shall be content."

Molesworth was a foundation Fellow of The Royal Australasian College of Physicians, and soon after its institution he obtained the diploma of radiology of the University of Sydney. In May, 1942, he was elected an honorary member of the Royal Society of Medicine "in recognition of distinguished service to science". For some years he was a member of the Medical Board of New South Wales. Molesworth had many friends in the ranks of the medical profession, but, like other men with strong personalities, he had associates who did not agree with his views and who occasionally differed very strongly from him. In spite of these differences, everyone recognized the sincerity displayed by "Moley" as he was generally called. At the memorial service held at Saint James's Church, Sydney, soon after his death, Mr. J. E. Cassidy, K.C., gave an address in which he used the following words:

> I picture him as I knew him and as I think some of those whom I see here also knew him: of robust intelligence, of originality of mind, forthright and decisive in expression, impulsive, generous, and ever ready to fight for the underdog, morally courageous. Never inclined to smugness, his medical enthusiasms did not grow dull, the dangerous comfort that comes often with material success and advancing age never dampened his ardour. Combined with these qualities were other very human ones which endeared him to us who understood him. Often tactless, often intolerant, not infrequently brusque and uncompromising with his patients, private and public alike, behind all, one knew, was an enormous kindliness and an enormous loyalty.

At the close of his address Mr. Cassidy said that Molesworth had written to him a month or two before his death, asking him to speak at his memorial service, and had used the following words:

> The letters which trail behind my name do not impress me very much, but I am proud of the work that made them possible. I would like the theme of the address to be work, work and keep on working.

Mr. Cassidy ended his address as follows:

> The early years of this country's development afford an eloquent record of splendid achievement of our pioneer fathers; the closing years of the last century and the early years of this sent forth into our national life great men imbued with a spirit of work, how vital in these present days, pregnant with promise of national greatness, waiting only for grand enterprise and endeavour from us all that we should apply the lesson this life has taught us: "Work and achieve."

From Molesworth's bibliography which follows the many contributions to the correspondence columns of this journal have been omitted.

Bibliography.

"The Cultural Characteristics of the Microbacillus of Acne", *British Medical Journal*, Volume I, 1910, pages 1227-1229.

"The Treatment of Acne Vulgaris by Vaccines of Acne Bacillus", *Transactions of the Australasian Medical Congress, Ninth Session*, Volume II, 1911, Sydney, pages 1140-1144.

"The Scope and Dosage of X-Ray Therapy", *Transactions of the Australasian Medical Congress, Ninth Session*, Volume II, 1911, Sydney, pages 1248-1265.

"Report of Over 350 Cases of Syphilis Treated with Salvarsan", *Australasian Medical Gazette*, Volume XXII, 1912, Sydney, pages 115-120.

"Two Cases of Skin Disease", *Australasian Medical Gazette*, Volume XXII, 1912, Sydney, page 3.

"A Case of Lymphadenoma Treated with X Rays", *Australasian Medical Gazette*, Volume XXXII, 1912, Sydney, page 218.

"Case of Giant Urticaria (Angio-Neurotic Œdema)", *Australasian Medical Gazette*, Volume XXXII, 1912, Sydney, page 218.

"Case of Dermatitis Exfoliata", *Australasian Medical Gazette*, Volume XXXII, 1912, Sydney, page 217.

"A Case of Lupus Vulgaris", *Australasian Medical Gazette*, Volume XXXII, 1912, Sydney, page 217.

"Arseno-Benzol Substitutes for German Salvarsan", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, August 19, 1916, pages 129-130.

"The Incidence of Venereal Disease and Method of Prevention", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, September 23, 1916, pages 243-250.

"Routine Treatment of Syphilis at Royal Prince Alfred Hospital", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, December 23, 1916, pages 541-542.

"A Case of Nodose Bromide Eruption in a Breast-Fed Infant", *British Journal of Dermatology*, Volume XXIX, 1917, London, pages 30-33.

"Dermatology, Radiology and Medical Electricity", *Transactions of the Australasian Medical Congress, Eleventh Session*, 1920, Brisbane, pages 510-513; also THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, September 11, 1920, pages 242-243.

"Arsenical Compounds in the Treatment of Syphilis", *Transactions of the Australasian Medical Congress, Eleventh Session*, 1920, Brisbane, pages 536-539.

"The Treatment of Vascular Nævi", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, May 27, 1922, pages 576-578.

"X-Ray Therapy", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, July 1, 1922, pages 1-11.

"Resistant Syphilis Controlled by Bismuth Injections", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, May 12, 1923, pages 529-530.

"The Ætiology of Rodent Ulcer", *Transactions of the Australasian Medical Congress, First Session*, 1923, Melbourne, pages 507-515.

"The Radiation Method of Cancer Treatment", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, August 30, 1924, pages 220-222.

"Acne Vulgaris: Its Cause and Treatment. An Essay for the General Practitioner", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, July 3, 1926, pages 10-12.

"The Leprosy Problem", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, September 18, 1926, pages 365-381.

"Rodent Ulcer", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, June 18, 1927, pages 878-899; also *Urologic and Cutaneous Review*, Volume XXXI, September, 1927, pages 543-564.

"Sensitization", *Transactions of the Australasian Medical Congress, Third Session*, 1929, Sydney, pages 131-135.

"Romance of Syphilis, and its Decline", *Urologic and Cutaneous Review*, Volume XXXIV, January, 1930, pages 18-23.

——— Harrison, B. J., and others, "Action of X Rays on Tumours", *Journal of the Cancer Research Committee of the University of Sydney*, Volume I, November, 1929, pages 179-183.

"Discussion of Evaluation of Various Methods of Treatment of Cancer", *Journal of the Cancer Research Committee of the University of Sydney*, Volume II, August, 1930, pages 95-105.

"Allergy as Applied to Dermatology", *Urologic and Cutaneous Review*, Volume XXXIV, October, 1930, pages 647-654.

"Leprosy", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, March 14, 1931, pages 324-327.

"Cancer of Skin", *Journal of the Cancer Research Committee of the University of Sydney*, Volume III, August 1, 1931, pages 67-76.

"Notes on Maximum Tolerated Dose of X Rays and on Holfelder's Resaturation Technique", *Journal of the Cancer Research Committee of the University of Sydney*, Volume III, November 2, 1931, pages 192-194.

"Prevention of Cancer of the Skin and Buccal Cavity", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, August 13, 1932, pp. 196-199.

"The Relationship between Allergy and Anaphylaxis", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, October 8, 1932, pages 447-452.

"Resaturation in Radiation Treatment of Cancer, with Suggestion for New Combined Technique", *Journal of the Cancer Research Committee of the University of Sydney*, Volume IV, November 1, 1932, pages 122-125.

"Evolution of Racial Resistance to Leprosy and Other Diseases", *Acta Dermato-Venereologica*, Volume XIII, August, 1932, pages 201-223.

"The Importance of Early Treatment of Vascular Nævi", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, August 12, 1933, page 217.

"Racial Resistance to Leprosy" (reply to Dr. Muir), *Acta Dermato-Venereologica*, Volume XIII, December, 1932, pages 735-739.

"Is Lupus Erythematosus a Tuberculide? Effect of Climate upon Lupus Erythematosus, Tuberculides, and Skin Tuberculosis", *Urologic and Cutaneous Review*, Volume XXXVII, September, 1933, pages 629-631.

"Influence of Natural Selection on Incidence of Leprosy", *International Journal of Leprosy*, Volume I, July, 1933, pages 265-282.

"Die Ätiologie und Zellpathologie des Haut- und Lippenkrebses in Australien", Dermatologische Wochenschrift, Volume XCIX, July 21, 1934, pages 945-951.

"Die Behandlung des Haut- und Lippenkrebses", Dermatologische Wochenschrift, Volume XCIX, September 1, 1934, pages 1134-1140.

"So-Called 'Dyskeratotic' Precarcinomatous Diseases", *Journal of the Cancer Research Committee of the University of Sydney*, Volume VI, November 1, 1934, pages 64-70.

"The Treatment of Cancer of the Lip by X Rays", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, June 9, 1934, pages 752-753.

"X-Ray Necrosis", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, July 7, 1934, pages 16-17.

"The Status of X-Ray Therapy in the Treatment of Cancer", *Transactions of the Australasian Medical Congress, Fourth Session*, 1934, Hobart, pages 32-35.

"Effect of Angle of Incidence Upon Dose of X Rays Absorbed by Skin", *The British Journal of Dermatology and Syphilis*, Volume XLVII, October, 1935, pages 408-410. (Reply to Kinnear.)

——— and Riddle, A. R., "X Rays: Effect of Angle of Incidence; Reply to Editor's Comment", Volume XLVII, October, 1935, pages 405-408.

——— and Riddle, A. R.: "Effect of Angle of Incidence upon Dose of X Rays Absorbed by Skin", *The British Journal of Dermatology and Syphilis*, Volume XLVII, April, 1935, pages 152-160.

"Photographic Method of Comparing Intensities of X Rays", by H. L. Brose and E. H. Molesworth, *British Journal of Radiology*, Volume X, January, 1937, pages 55-59.

"Comparison of X-Ray Intensities by Means of Time Measurements", by H. L. Brose and E. H. Molesworth, *British Journal of Radiology*, Volume X, May, 1937, pages 427-429.

"Absorption of X Rays by Skin", by H. L. Brose and E. H. Molesworth, *British Journal of Radiology*, Volume X, July, 1937, pages 567-570.

"Carcinoma of Skin and Lip", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, August 7, 1937, pages 218-221.

——— and Brose, H. L., "New Technique for Epilation of Scalp (to Provide more Even Distribution of Dose than that Obtainable in Adamson-Kienböck Technique)", *The British Journal of Dermatology and Syphilis*, Volume L, August-September, 1938, pages 435-440.

"An Address", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, April 1, 1939, pages 491-494.

"An Address", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, April 22, 1939, pages 601-609.

"Drug Eruptions", *Bulletin of the Post-Graduate Committee in Medicine in the University of Sydney*, Volume I, June, 1945, pages 20-23.

"The Effect of Endocrine Disturbances as Manifested in the Skin", *Bulletin of the Post-Graduate Committee in Medicine in the University of Sydney*, Volume I, June, 1945, pages 23-26.

"Occipital Lichenification in Women", *Urologic and Cutaneous Review*, Volume L, January, 1946, page 61.

"Herbert Michael Moran", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, March 23, 1946, pages 415-416.

"Arthur Whitfield", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, May 17, 1947, page 631.

"Few Notes on Dermatologic Pioneers in Sydney, Australia", *Urologic and Cutaneous Review*, Volume LI, June, 1947, page 366.

HENRY JESSE WEST.

WE regret to announce the death of Dr. Henry Jesse West, which occurred on November 24, 1950, at Sydney.

ALBERT JOHN WILLIAM PHILPOTT.

WE regret to announce the death of Dr. Albert John William Philpott, which occurred on November 25, 1950, at Kew, Victoria.

Australasian Medical Publishing Company, Limited.

ANNUAL MEETING.

THE annual meeting of the Australasian Medical Publishing Company, Limited, was held at The Printing House, Seamer Street, Glebe, New South Wales, on November 22, 1950, Dr. W. L. Calov in the chair.

Directors' Report.

The report of the directors of the company was as follows:

The directors submit their report for the twelve months ended June 30, 1950, together with the balance sheet as at June 30, 1950, and the profit and loss account for the twelve months ended June 30, 1950.

Dr. D. D. Paton, who had been a director of the company from 1927 to 1950, retired on February 28, 1950, and Dr. F. W. Carter, who was nominated as a member by the Western Australian Branch Council, was appointed to fill the vacancy in the directorate.

Plans to enlarge the journal have been put into effect during the year and the journal maintains its high standard.

The result of the year's production in the printing and publishing department was satisfactory, and a small surplus remains after providing for depreciation and taxation.

With the object of preserving the personal interest in the company of members of the several Branches of the British Medical Association in Australia, efforts are made when debentures registered in the name of a deceased holder are surrendered for redemption, to locate a buyer for them in the State in which the deceased holder resided. It is thought that it would be more satisfactory if some of the younger members of the Branches in the several States would purchase a number of these debentures when they fall due for redemption, rather than that they should be redeemed by the company.

The company's reserves are used in the business and we consider the state of the company's affairs is satisfactory. Provision has been made for the payment of debenture interest for the year ended June 30, 1950.

Dr. F. W. Carter and Dr. W. L. Crowther retire from office by rotation in accordance with the Articles of Association (Article 39). They are eligible and present themselves for reelection.

W. L. CALOV,
Chairman.

September 25, 1950.

Election of Directors.

Dr. F. W. Carter and Dr. W. L. Crowther were reelected to the Board of Directors.

Australian Medical Board Proceedings.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

Hickey, William John, M.B., B.S., 1949 (Univ. Queensland), Royal Hobart Hospital.

Stuart, Angus Erskine, M.B., Ch.B., 1948 (Univ. Glasgow), Launceston.

Jobson, Felix Charles, M.R.C.S. (England), L.R.C.P. (London), 1942, Launceston.

The following additional qualification has been registered:

Hamilton, John Bruce, M.D., 1948 (Univ. Sydney).

QUEENSLAND.

THE undermentioned have been registered, pursuant to the provisions of *The Medical Acts*, 1938 to 1948, of Queensland, as duly qualified medical practitioners:

Powell, Cyril Edward, M.R.C.S. (England), L.R.C.P. (London), 1942, Palmerin Street, Warwick.

Stenning, Frederick Arthur, M.B., B.S., 1947 (Univ. Melbourne), c.o. Hospitals Board, Mount Isa.

Lisyak, John, M.B., B.S., 1950 (Univ. Sydney), c.o. Hospitals Board, Maryborough.

Walker, Thomas Bridson, M.B., B.S., 1950 (Univ. Sydney), c.o. Hospitals Board, Toowoomba.

The following additional qualifications have been registered:

Anderson, Neville George, Avon Lodge, Riding Road, Hawthorne, Brisbane, D.C.H., R.C.P. and S. (London), 1950.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED NOVEMBER 18, 1950.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.[2]	Australian Capital Territory.[2]	Australia.[3]
Ankylostomiasis	*	..	..	..	2	..	..	..	2
Anthrax	*	..	..	..	..	..	..	..	..
Beriberi	*	*	*	*	*	*	..	*	..
Bilharziasis	*	..	..	..	..	..	..	..	..
Cerebro-spinal Meningitis	..	..	2	..	..	..	..	..	2
Cholera	..	..	..	..	..	..	..	..	..
Coastal Fever(*a*)	*	*	..	*	*	*	*	*	..
Dengue	*	*	*	*	*	*	..	*	..
Diarrhœa (Infantile)	..	..	8(8)	..	..	..	..	..	8
Diphtheria	6(4)	6(4)	7(3)	..	4(2)	1(1)	..	..	24
Dysentery (Amœbic)	*	..	..	..	..	2	..	..	2
Dysentery (Bacillary)	*	..	1(1)	..	..	..	..	4	5
Encephalitis Lethargica	..	*	*	1(1)	*	*	..	..	1
Erysipelas	*	..	..	..	..	..	..	..	..
Filariasis	*	..	*	*	*	*	*	*	..
Helminthiasis	*	1	*	*	..	*	*	..	1
Hydatid	*	*	*	..	*	*	..	*	..
Influenza	*	*	..	*	*	*	*	*	..
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	*	..	..	..	1	..	..	..	1
Malaria(*b*)	*	*	*	341(186)	*	*	..	1	342
Measles	..	..	..	..	..	..	..	..	..
Plague	32(8)	5(2)	7	7(7)	..	..	..	..	51
Poliomyelitis	*	..	*	..	*	*	*	*	..
Psittacosis	..	..	..	1(1)	..	..	..	..	1
Puerperal Fever	..	..	..	*	..	..	..	..	..
Rubella(*c*)	..	*	..	..	*	..	..	..	..
Scarlet Fever	30(12)	10(9)	28(27)	11(10)	7(6)	1(1)	..	..	87
Smallpox	*	..	..	..	..	..	*	*	..
Tetanus	*	..	..	..	..	..	*	*	..
Trachoma	*	..	..	*	*	*	*	*	..
Tuberculosis(*d*)	31(23)	28(23)	13(8)	4(3)	10(6)	5(1)	..	..	91
Typhoid Fever(*e*)	1(1)	..	..	..	2(1)	..	..	..	3
Typhus (Endemic)(*f*)	..	..	..	..	..	..	..	..	..
Undulant Fever	..	..	..	..	..	..	..	..	..
Weil's Disease(*g*)	*	*	1	*	*	*	*	*	1
Whooping Cough	*	*	*	3	*	*	..	..	3
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] The form of this table is taken from the *Official Year Book of the Commonwealth of Australia*, Number 37, 1946–1947. Figures in parentheses are those for the metropolitan area.
[2] Figures not available.
[3] Figures incomplete owing to absence of returns from the Northern Territory and Australian Capital Territory.
* Not notifiable.
(*a*) Includes Mossman and Sarina fevers. (*b*) Mainly relapses among servicemen infected overseas. (*c*) Notifiable disease in Queensland in females aged over fourteen years. (*d*) Includes all forms. (*e*) Includes enteric fever, paratyphoid fevers and other Salmonella infections. (*f*) Includes scrub, murine and tick typhus. (*g*) Includes leptospiroses, Weil's and para-Weil's disease.

Mann, Claude Bertram Russell, No. 2 Meerawa, Lapraik Street, Clayfield N2, Brisbane, F.R.C.S. (England), 1948, F.R.C.S. (Edinburgh), 1948.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 67, of November 9, 1950.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Appointment.—Brian Hayley Webb is appointed Surgeon Lieutenant (for short service), dated 14th August, 1950.

Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Reserve.

Appointments.—Barry Rutherford Grove and Richard Peter Freeman are appointed Surgeon Lieutenants, dated 18th August, 1950, and 31st August, 1950, respectively.

AUSTRALIAN MILITARY FORCES.

Citizen Military Forces.

Northern Command: First Military District.

Royal Australian Army Medical Corps (Medical).—1/46862 Honorary Captain G. Ricketts is appointed from the Reserve of Officers and to be Captain (provisionally), 25th August, 1950.

Eastern Command: Second Military District.

Royal Australian Army Medical Corps (Medical): To be Captains (provisionally), 22nd September, 1950.—2/127806 Eric Joseph Fitzsimons and 2/50668 John Ferdinand Butler.

Central Command: Fourth Military District.

Royal Australian Army Medical Corps (Medical).—4/35226 Honorary Captain S. C. Milazzo is appointed from the Reserve of Officers and to be Captain (provisionally), 15th August, 1950.

The notification respecting 4/31903 Captain (Temporary Major) C. N. Gurner which appeared in Executive Minute No. 107 of 1950, promulgated in *Commonwealth Gazette,* No. 32, of 1950, is withdrawn.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps.

1st Military District: To be Honorary Captain, 21st August, 1950.—John Woodley.

6th Military District.—Major R. Whishaw is placed upon the retired list (6th Military District) with permission to retain his rank and wear the prescribed uniform, 23rd August, 1950.

ROYAL AUSTRALIAN AIR FORCE.

Active Citizens Air Force: Medical Branch.

The notification regarding Flight Lieutenant W. A. Newnham (05978), as approved in Executive Council Minute No. 47 of 1950, appearing in Gazette No. 51, dated 31st August, 1950, is withdrawn.

Flight Lieutenant R. R. Collmann (034061) is transferred to the Reserve, 8th September, 1950.

Medical Appointments.

Dr. Keith Roland McLachlan has been appointed Quarantine Officer at Narromine, New South Wales, under the provisions of the *Quarantine Act,* 1908-1947.

Dr. E. S. Stuckey has been appointed honorary surgeon at the Royal Alexandra Hospital for Children, Camperdown, Sydney.

Dr. F. N. Street has been appointed honorary assistant surgeon at the Royal Alexandra Hospital for Children, Camperdown, Sydney.

Dr. D. H. Cohen and Dr. N. A. Fowler have been appointed honorary relieving assistant surgeons at the Royal Alexandra Hospital for Children, Camperdown, Sydney.

Dr. E. M. Puleston-Jones has been appointed to the Department of Public Health of New South Wales.

Dr. D. McL. Somerville has been appointed to the Division of Mental Hygiene, Department of Public Health, New South Wales.

Dr. P. S. Messent, Dr. J. W. Rollison, Dr. G. H. McQueen, Dr. G. H. Burnell and Dr. E. B. Jones have been appointed members of the Medical Board of South Australia.

Dr. Alexander Johnson has been appointed quarantine officer under the provisions of the *Quarantine Act,* 1908-1947.

Dr. Desmond John Pittar has been appointed honorary pathologist and bacteriologist to the Port Pirie Hospital, South Australia.

Dr. Robert Austin Kenihan has been appointed gynæcological registrar at the Royal Adelaide Hospital, Adelaide, South Australia.

Diary for the Month.

DEC. 11.—Victorian Branch, B.M.A.: Executive Meeting.
DEC. 12.—New South Wales Branch, B.M.A.: Ethics Committee. Medical Politics Committee.
DEC. 13.—Victorian Branch, B.M.A.: Council Meeting.
DEC. 14.—New South Wales Branch, B.M.A.: Branch Meeting.
DEC. 15.—Queensland Branch, B.M.A.: Council Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney)—All contract practice appointments in New South Wales.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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